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Cordeiro, N.J. & Githiru, M. 2000. Conservation evaluation for birds of *Brachylaena* woodland and mixed dry forest in north-east Tanzania. *Bird Conservation International* 10: 47-65.

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(continued on inside back cover)

Scopus 24: 1–10, July 2004

Variation in waterbird populations of two freshwater lakes in Marsabit National Park, northern Kenya

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Luca Borghesio

Northern Kenya is mainly arid and supports a typically dryland avifauna. However a few wetlands also occur in the region which are a strong attraction for resident and migrant waterbirds, being the only stopover sites in a very large area. These sites could therefore be of high conservation value.

In recent years, some of the most important wetlands of central Kenya have been regularly monitored, and the fluctuations of waterbird populations in these areas are now fairly well known (Owino *et al.* 2001, Owino *et al.* 2002). By contrast, very little information is available from northern Kenya. The Lake Turkana area is known to host important waterbird populations (Schekkerman & van Wetten 1987, Bennun & Fasola 1996, Borghesio & Ndang'ang'a 2001), but other sites have never been monitored and no information is available on the size and fluctuations of waterbird populations, nor on the ecological factors that influence them.

In this paper I report the first waterbird counts carried out on two small wetlands in Marsabit National Park, Northern Kenya. I analyse patterns of seasonal variation, and relate the differences between the waterbird communities of the two lakes to the introduction of fish into one of the lakes by humans.

Study area

Marsabit National Park (37°58'E, 02°17'N) protects a vast area of desert, but is mainly known for its forest, which has an area of approximately 120 km^2 and grows on the slopes of an extinguished volcano, at altitudes ranging between 1300 and 1700 m above sea level. The craters of the volcano are occupied by Sokorte Dika and Lake Paradise, two shallow freshwater basins approximately circular in shape (Figure 1). Although somewhat different in size (Table 1), the two lakes are remarkably similar in appearance. Both of them have neither inflows nor outflows and are apparently only fed by rain. The lakes are fringed by expanses (about 10 m wide) of mudflats and have no reedbeds along the shores. Both lakes are regularly visited by large mammals (Elephants *Loxodonta africana* and African Buffalo *Syncerus caffer*) which come to drink. The two lakes are permanent and the water level seems to be fairly constant,

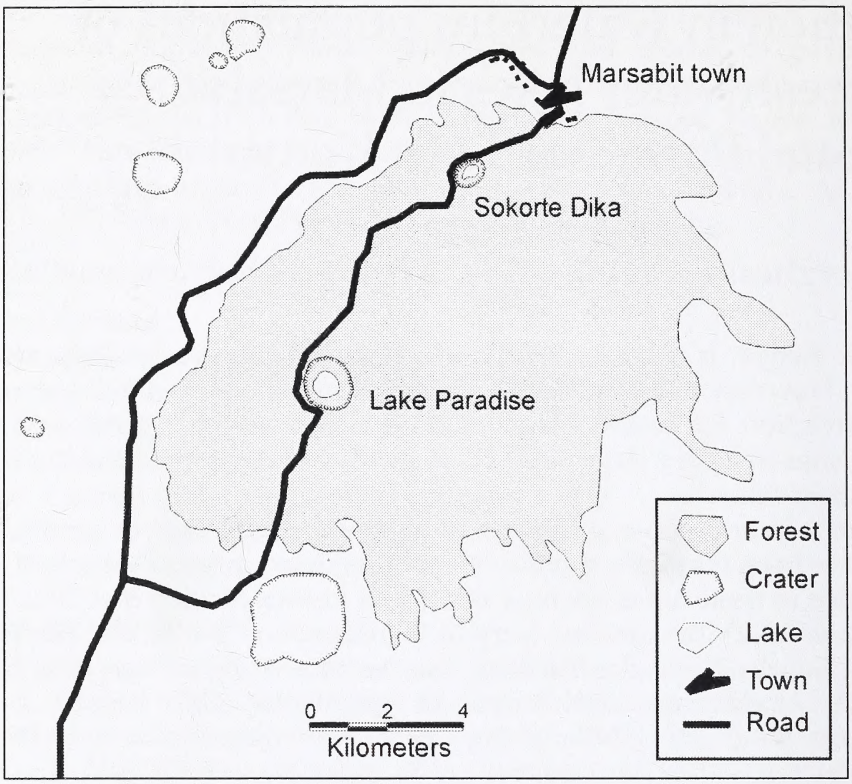

Figure 1. Map of Marsabit forest, showing the position of the two lakes.

Table 1. Size of the two lakes surveyed. Measurements were taken from Landsat satellite imagery of January 1986 (downloaded from http://glcf.umiacs.umd.edu/index.shtml on 15 May 2003).

	Sokorte Dika	Lake Paradise
Main dimensions (km)	0.30x0.50	0.68x0.70
Total water surface (km²)	0.10	0.36
Perimeter (km)	1.33	2.17

as could be observed during four visits to the area at different times of the year between 1986 and 2002 (pers. obs.).

The most obvious difference between the two lakes is the presence of large quantities of submerged vegetation (*Dichotiledones* spp) in Lake Paradise. These plants appear to be almost absent from Sokorte. However, at Sokorte there are abundant fish, considered to be Nile Tilapia *Oreochromis niloticus*. These fish are not native and, according to local people, were brought to Sokorte from Lake Turkana in the early 1990s. There is no information on why the introduction was made, nor on who did it, although it is likely that the aim was to allow fishing in the lake. However, at the moment, no fishing occurs in the area.

Methods

Waterbirds were counted at Lake Paradise between 7 and 9 March 2000 and again on 30 November and 1 December 2002. Sokorte Dika was counted on 9 and 10 March 2000 and on 5, 6 and 8 December 2002. Since the two lakes are relatively small, the entire length of the shores of one lake could be surveyed in one day, thus two or three complete censuses were available for each lake in both seasons; I used the maximum count of each species as the best estimate of its population in each lake. The same counting technique was adopted during all censuses: walking slowly along the shores and observing birds with 10x40 binoculars.

All waterbird species observed were classified according to their migratory status (African, Palaearctic migrant or having both resident and Palaearctic migrant individuals), feeding zone (open water or close to the shore) and main food source (1=Fish and Amphibians, 2=Invertebrates, 3=Aquatic plants, 4=Terrestrial plants, 5=Omnivorous). Finally, the total bird biomass in each lake was calculated. All the information for these analyses was extracted from published sources (Cramp & Simmons 1977, 1980, 1983, Britton 1980, Brown *et al.* 1982, Urban *et al.* 1986, Maclean 1993, Zimmerman *et al.* 1996). The data were analysed using Chi-squared tests to compare numbers of individuals of different species, feeding and migratory groups between the two lakes and between years. Common and scientific names follow EANHS (1996).

The shores of both lakes were walked thoroughly in December 2002, recording the presence of living fish in the water and the number of dead fish on the shore.

Results

Waterbird community

A total of 34 waterbird species was observed in the two years (Table 2). Twenty-nine species were observed at Lake Paradise, and 17 at Sokorte. Most of the species observed at Sokorte were also seen at Lake Paradise, but three piscivorous species that were only seen at Sokorte (Pink-backed Pelican *Pelecanus rufescens*, Black Stork *Ciconia nigra* and African Darter *Anhinga rufa*) were also new records for the Bird Atlas of Kenya (Lewis & Pomeroy 1989). African residents were always numerically dominant in both lakes and years, and accounted for 78–95% of individuals. Palaearctic migrants were almost completely absent in March 2000 (two individuals in all), but they increased slightly at Lake Paradise in November–December 2002 (87 individuals, 76 of which were ducks).

Waterbird density was always much higher at Lake Paradise than at Sokorte (Table 3). At Lake Paradise, both the number of species and number of individuals increased dramatically in November–December 2002 compared with March 2000 (Table 3). The increase in the number of

Table2. Summary of waterbird counts at Marsabit, March 2000 and November–December 2002. A=African, P=Palaearctic, W=Water, S=Shore, IN=Invertebrates, FI=Fish, AM=Amphibians, TP=Terrestrial plants, AP=Aquatic plants, OM=Omnivore.

Common name	Scientific name	Body mass (g)	Food source	Feeding zone	Migratory status	L. Paradise 2000	L. Paradise 2002	Sokorte Dika 2000	Sokorte Dika 2002
Little Grebe	*Tachybaptus ruficollis*	147	IN	W	A	200	180	2	1
Pink-backed Pelican	*Pelecanus rufescens*	5200	FI, AM	W	A	0	0	1	0
Long-tailed Cormorant	*Phalacrocorax africanus*	577	FI, AM	W	A	1	0	0	0
African Darter	*Anhinga rufa*	1382	FI, AM	W	A	0	0	1	0
Common Squacco Heron	*Ardeola ralloides*	299	FI, AM	S	A, P	0	2	0	0
Great Egret	*Casmerodius albus*	1110	FI, AM	S	A, P	0	2	0	0
Grey Heron	*Ardea cinerea*	1350	FI, AM	S	A, P	1	3	7	0
Black-headed Heron	*Ardea melanocephala*	1135	FI, AM	S	A	5	0	1	0
Hamerkop	*Scopus umbretta*	420	FI, AM	S	A	2	1	0	1
Black Stork	*Ciconia nigra*	3000	FI, AM	S	P	0	0	0	1
African Open-billed Stork	*Anastomus lamelligerus*	1052	IN	S	A	22	12	0	0
Yellow-billed Stork	*Mycteria ibis*	1500	FI, AM	S	A	0	0	6	0
Sacred Ibis	*Threskiornis aethiopicus*	1253	FI, AM	S	A	20	5	6	0
Glossy Ibis	*Plegadis falcinellus*	650	IN	S	P	0	2	0	0
African Spoonbill	*Platalea alba*	1604	IN	S	A	0	1	3	0
White-faced Whistling Duck	*Dendrocygna viduata*	690	TP	S	A	15	2	0	0
White-backed Duck	*Thalassornis leuconotus*	678	AP	W	A	50	43	0	0
Egyptian Goose	*Alopochen aegyptius*	2270	TP	S	A	15	4	20	40
Mallard	*Anas platyrhynchos*	1050	OM	W	P	0	9	0	0
Garganey	*Anas querquedula*	343	OM	W	P	0	10	0	0
Northern Pintail	*Anas acuta*	825	OM	W	P	0	12	0	0
Red-billed Teal	*Anas erythrorhyncha*	568	OM	W	A	15	95	0	0
Hottentot Teal	*Anas hottentota*	243	OM	W	A	15	45	0	0
Northern Shoveler	*Anas clypeata*	600	OM	W	P	0	45	0	0
Southern Pochard	*Netta erythrophthalma*	781	OM	W	A	200	105	0	0
Maccoa Duck	*Oxyura maccoa*	687	IN	W	A	5	2	0	0
Black Kite	*Milvus migrans*	750	FI, AM	W	A, P	5	1	3	0
African Fish Eagle	*Haliaeetus vocifer*	2800	FI, AM	W	A	2	2	1	2
Red-knobbed Coot	*Fulica cristata*	738	AP	W	A	1000	2600	0	1
Black-winged Stilt	*Himantopus himantopus*	168	IN	S	A, P	100	63	0	2
Spur-winged Plover	*Vanellus spinosus*	148	IN	S	A	20	6	0	0
Marsh Sandpiper	*Tringa stagnatilis*	67	IN	S	P	0	1	0	0
Wood Sandpiper	*Tringa glareola*	60	IN	S	P	1	8	0	1
Common Sandpiper	*Actitits hypoleucus*	44	IN	S	P	0	0	1	0

Table 3. Summary of waterbird counts.

	Lake Paradise 2000	Lake Paradise 2002	Sokorte Dika 2000	Sokorte Dika 2002
Feeding categories				
Fish, Amphibians	36	16	26	4
Invertebrates	348	275	6	4
Aquatic vegetation	1050	2643	0	1
Terrestrial vegetation	30	6	20	40
Aquatic omnivore	230	321	0	0
Feeding zone				
Shore	201	112	44	45
Water	1493	3149	8	4
Migratory status				
African	1587	3103	41	45
African & Palaearctic	106	71	10	2
Palaearctic	1	87	1	2
Total number of individuals	1694	3261	52	49
Number of species	20	27	12	8
Density (birds/km^2)	4706	9058	520	490

species in 2002 was mainly due to the presence of Palaearctic migrants in the second year (Table 2), while most of the increase in the number of individuals was due to Red-knobbed Coot *Fulica cristata* (χ^2_1=711, p<0.001). At Sokorte, less species were observed in 2002 (Table 3), but there were no significant changes in the total abundance of waterbirds (χ^2_1=0.1, p>0.05, Table 3).

The proportion of the total number of individuals represented by the five feeding groups differed between the two lakes, both on the shore (χ^2_1=148, p<0.001) and on the open water (χ^2_1=349, p<0.001). On the lake shores, invertebrate-feeders predominated at Lake Paradise, while at Sokorte the most abundant group was the terrestrial herbivores (Figure 2a). In the water, herbivorous species predominated at Lake Paradise, while species eating fish and amphibians accounted for a higher proportion at Sokorte (Figure 2b).

Considering the total biomass (expressed in kg/ha) of the different groups (Figure 3), herbivorous species accounted for most of the biomass at both lakes, but at Lake Paradise aquatic herbivores predominated, while at Sokorte herbivores were mostly terrestrial. Piscivorous species were almost absent at Lake Paradise, but they accounted for a notable proportion of the biomass at Sokorte in both years. Total biomass was much lower at Sokorte than at lake Paradise (Figure 3).

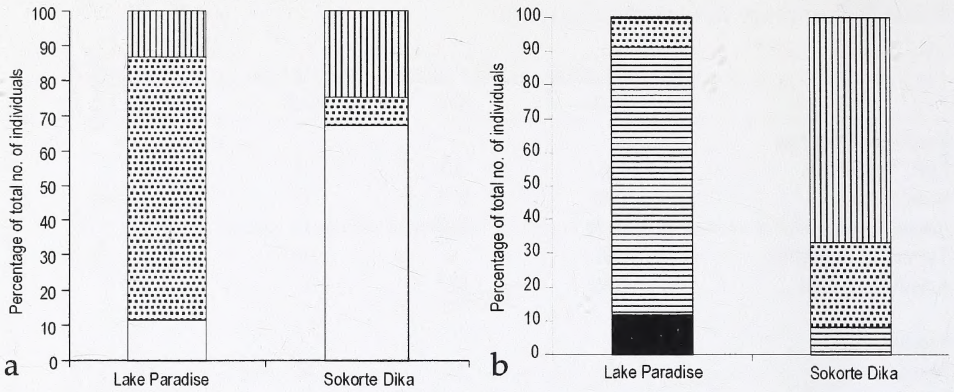

Figure 2a,b. Percentage (over total number of individuals) of different feeding groups censused in a) lake shore and b) open water in the two lakes. Data for 2000 and 2002 censuses are combined. See Figure 4 for key.

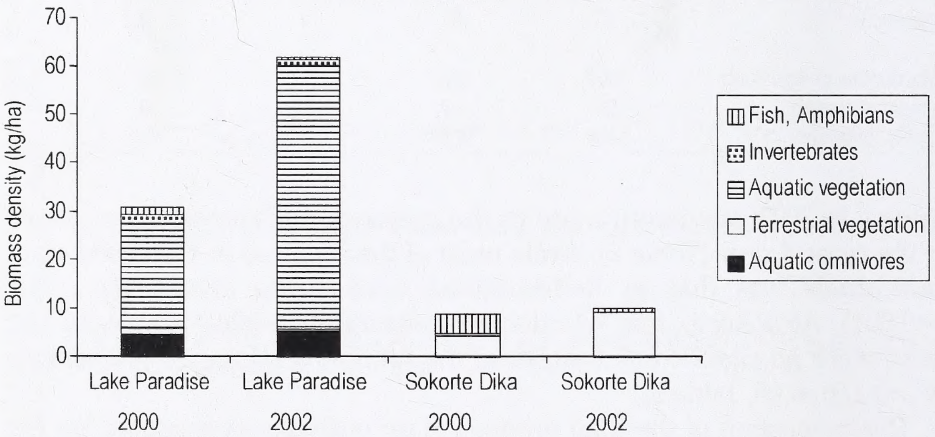

Figure 3. Average total biomass (kg/ha) of waterbird species selecting different food sources.

Fish presence and abundance

No sign of fish presence was noted at Lake Paradise. At Sokorte, fish (Nile Tilapia) were very abundant in the water, although no precise estimates of population density could be obtained, as the waters were very muddy. However, along the shore there were large numbers of dead fish: along a 76 m section of shore 186 corpses (2.4/m) were counted. The average size of dead individuals was estimated as 12.1±2.3 cm (n=17).

Discussion

This article describes the results of the first waterbird counts at Marsabit. Although the presence of most of the species observed in this survey has already been reported in the area in the past (Lewis & Pomeroy 1989), this study showed that some of these little-known water bodies can regularly host large numbers of waterbirds, among which

are regionally-threatened species (White-backed duck *Thalassornis leuconotus*, Maccoa Duck *Oxyura maccoa* and African Darter (Bennun & Njoroge 1996)), and species that have rarely been recorded in Kenya (Mallard *Anas platyrhynchos* (EANHS 1996)). African resident species make up the bulk of the individuals, but the lakes of Marsabit could also be important as a temporary resting area for Palaearctic species during migration. Some of the changes observed between the two years are related to seasonality. In particular, the increase of Palaearctic migrants in 2002 might be due to the fact that in this year counts were made in November–December, that is, after the end of the breeding season in the northern hemisphere, when many migrant species reach Africa for wintering. Palaearctic migrants may well have left the area when the counts in March 2000 were carried out. African species also fluctuated: Red-knobbed Coot was much more abundant in 2002 than in 2000. The causes for this change are not clear, and the present data are not sufficient to answer this question. However, populations of rallidae are known to fluctuate strongly from year to year in other Kenyan Lakes (Owino *et al.* 2002), and thus the pattern found in the lakes of Marsabit does not seem exceptional.

An important result is the demonstration of a striking difference between the fauna of the two survey areas. Lake Paradise had an abundant waterbird community, where aquatic herbivores and invertebrate-feeders dominated. At Sokorte, bird numbers and biomasses were much lower. Here, piscivorous and terrestrial herbivorous species dominated. This difference is best explained by ecological changes brought about by the introduction of tilapia by humans. Nile Tilapia, a very adaptable species with a high reproductive output, is one of the most frequently introduced fishes in freshwater ecosystems, and is often considered a pest in tropical and subtropical areas throughout the world (Ogutu-Ohwayo 1990, Froese & Pauly 2003). It is a herbivore, and can reach very high population densities when predator densities are low (Froese & Pauly 2003).

The evidence gathered in the field suggests that at Sokorte, introduced fish effected large ecosystem shifts, by consuming most of the aquatic plants that probably once lived in the lake (as still found in Lake Paradise). In turn, the disappearance of aquatic plants caused the demise of herbivorous birds. This hypothesis is strengthened by a photograph taken at Sokorte in August 1986 (prior to the introduction of fish). The image (Figure 4) shows that numerous waterbirds (apparently mostly Red-knobbed Coot) frequented the lake at that time. By the year 2000, most herbivorous waterbirds had disappeared: only species such as geese that mainly feed on terrestrial plants persisted. It is also likely that invertebrate populations dropped strongly after the decrease of aquatic plants (due to the lack of shelter and food sources), and this in turn caused the almost complete disappearance of invertebrate-feeding

Figure 4. Lake Sokorte, August 1986. Numerous birds are clearly visible in the water. Most of them appear to be Red-knobbed Coot (L. Borghesio).

birds. By contrast, piscivores increased at Sokorte, although their total biomass had not reach a very high level (Figure 3), presumably because predators, being second-order consumers, cannot sustain biomasses as high as those of herbivores (Krebs 1994).

Another possible effect of the introduction of fish at Sokorte was an increase in bird species diversity, the result of the local waterbird fauna being joined by piscivorous species (Pink-backed Pelican, African Darter, Black Stork), whose presence had not been previously reported in Marsabit according to the Bird Atlas of Kenya (Lewis & Pomeroy 1989). An increase in ecosystem diversity following the introduction of fish has already been found in other Kenyan lakes (Jacobs 1975), but at Sokorte, the small increase of piscivorous species was obtained at the expense of a near total demise of the herbivorous and insectivorous waterbirds (coots, ducks). On the whole, it seems likely that fish at Sokorte had very negative effects on the local ecosystem, causing a strong reduction of bird biomass and a shift in community composition. Should fish be introduced to Lake Paradise as well, which at present appears to be fish free, a similar shift could occur, in which a rich bird community dominated by herbivores and insectivores would be substituted by a small number of mostly piscivorous species. It is important that local Park authorities and game rangers responsible for the protected area are informed about this danger so they can adopt measures to avoid the introduction of fish to Lake Paradise, whose ecosystem is vulnerable to serious damage.

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Birds of the Kihansi Gorge, south-eastern Udzungwa Mountains

Norbert J. Cordeiro, Elia Mulungu, Godfrey G. Maina and Jon C. Lovett

Introduction

Birds of the Eastern Arc Mountains have received considerable attention in the last two decades. New species and new populations have been discovered in some of the more remote forests (e.g. Jensen 1983, Dinesen et al. 1994), and the ecology of many forest birds is becoming better known. The general ecology and distribution of the Udzungwa avifauna has been reported on by several authors (e.g. Stuart *et al.* 1987, Jensen & Brøgger-Jensen 1992, Dinesen *et al.* 1993, Moyer 1993, Fjeldså 1999), and a recent paper (Dinesen *et al.* 2001) evaluates priorities for conservation of biodiversity in most forest patches in the range.

Some of the smaller or remote forest reserves in the Udzungwas still remain largely unexplored. As forest loss and fragmentation continues, there remains a pressing need to inventory biota of such patches to initiate their conservation. Until recently, one of the unexplored forest patches was in the remote Kihansi gorge (35° 52′ E, 8° 14′ S), which is part of the Njerera Forest Reserve and is now covered by the Lower Kihansi Hydropower Project (LKHP) area. During the course of a three-year environmental monitoring programme to investigate the impact of the LKHP on the flora and fauna of the Kihansi gorge we documented forest species occurring in the area. This study included surveys of threatened and non-threatened bird species in the gorge to determine whether they were susceptible to population declines from environmental changes created by the LKHP.

In this paper, we present and discuss our important findings regarding the distribution of birds in the Njerera FR and environs. We complement our findings with a preliminary ornithological study in this forest in September 1994 (Rahner 1995).

Study area and methods

Njerera FR is a 2834 ha reserve gazetted in 1957 on the south-eastern edge of the Udzungwa Mountains, just below Uhafiwa. It covers the east-facing escarpment and two riverine gorges, those of the Kihansi and Udagaje rivers (Figure 1). The LKHP project, which was initiated in 1994 and completed in 2000, covers an area that includes the Njerera FR, as well as hilly uplands above the escarpment and a section of

escarpment to the south of the reserve. Closed canopy evergreen moist forest occurs in the Kihansi and Udagaje gorges, with a canopy 30–40 m high. The escarpment is covered with Zambezian woodland *(sensu* White 1983) dominated by *Brachystegia* spp. (Miombo woodland).

Kihansi and Udagaje Gorges were the primary sites for our investigations. The Kihansi forest patch was larger and the elevational range greater. As a consequence, more species were found there. Tree species from both gorges are shown in table 1. The mixed forest in Kihansi Gorge (*c.* 90 ha) is rich in large tree species. A small patch of *Filicium decipiens* occurs next to mixed forest in the upper parts of the gorge (500–600 m). Although this forest is dominated by large trees of *Filicium decipiens* it contains several species also found in the mixed forests. Further details of Kihansi gorge can be found in Lovett *et al.* (1997). Udagaje gorge is about 1.5 km to the east of Kihansi gorge, and the forest (*c.* 40 ha) is floristically similar to the Kihansi mixed forest (Table 1). Above the gorge, montane forest occurs along the river and above the dam site.

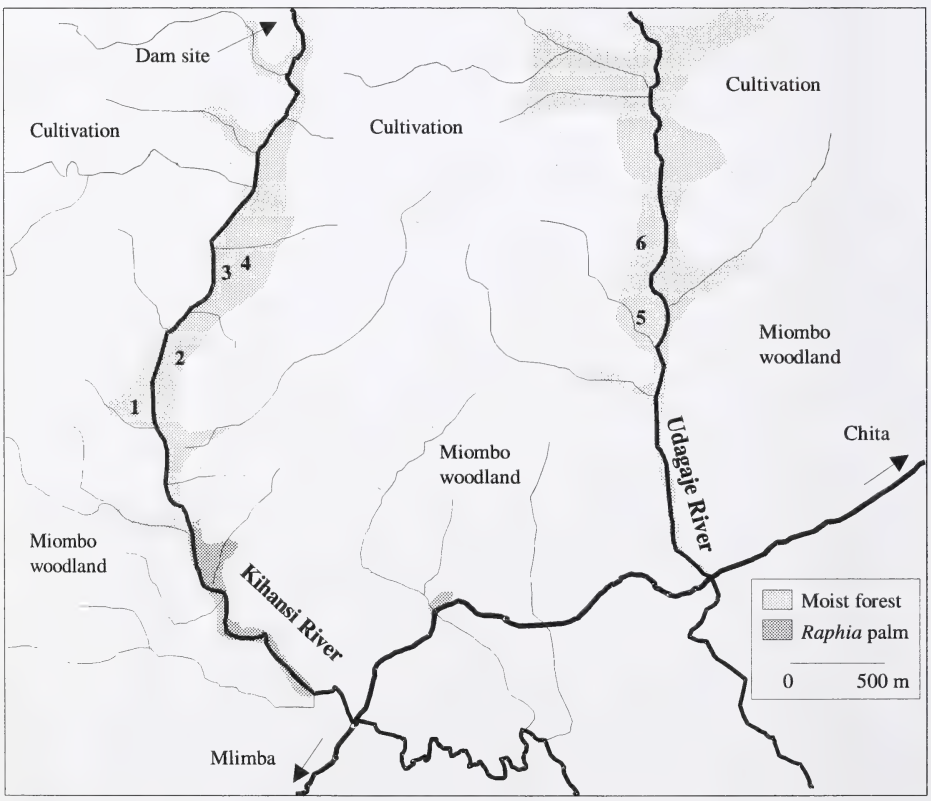

Figure 1. Map showing the extent of moist forest in the Kihansi and Udagaje gorges. Bird sampling stations are marked as follows: 1=520 m; 2=630 m; 3=760 m (moist forest type); 4=820 m *(Filicium* forest type) in Kihansi Gorge; 5=510 m; 6=620 m in Udagaje Gorge.

Table 1. Trees of >20 cm diameter at breast height recorded from the mixed forest of Kihansi Gorge (KM), the *Filicium* forest of Kihansi Gorge (KF) and the Udagaje Gorge (UM). The list is not complete, particularly for Udagaje Gorge.

Tree species	KM	KF	UM
Albizia gummifera	✓		
Allanblackia stuhlmanni	✓		
Antiaris toxicaria var. usambarensis	✓		
Bombax rhodognaphalon	✓		
Carpolobia goetzei	✓		
Celtis zenkeri		✓	
Cephalosphaera usambarensis	✓		
Cola greenwayi	✓		
Cola microcarpa	✓		
Cola scheffleri	✓	✓	
Croton sylvaticus		✓	
Cussonia zimmermannii	✓		
Cylicomorpha parviflora	✓		
Cynometra sp.	✓		
Drypetes usambarica var. usambarica	✓	✓	✓
Englerophytum natalense	✓	✓	✓
Erythrina abyssinica	✓		
Erythroxylon emarginatum	✓		
Fernandoa magnifica	✓		
Ficus exasperata		✓	
Ficus lutea	✓		
Ficus mucuso	✓		
Ficus vallis-choudae	✓		
Filicium decipiens	✓	✓	✓
Garcinia buchananii	✓	✓	
Garcinia semseii	✓	✓	✓
Haplocoelium foliolosum	✓		
Haplocoelopsis africana	✓	✓	
Holarrhena pubescens		✓	
Isolona heinsenii	✓	✓	
Lagynias pallidiflora	✓	✓	✓
Lecaniodiscus fraxinifolius	✓		
Leptactina platyphylla	✓		
Leptonychia usambarensis	✓	✓	
Lettowianthus stellatus	✓		
Ludia mauritiana	✓	✓	
Macaranga capensis			✓
Milicia excelsa	✓		✓
Milletia oblata ssp. intermedia	✓		✓
Mimusops kummel	✓		
Monodora grandidieri	✓	✓	
Multidentia crassa		✓	
Newtonia buchananii	✓	✓	✓
Olea capensis	✓	✓	
Parinari excelsa	✓	✓	✓
Paramacrolobium coeruleum	✓		
Polysphaeria braunii	✓		
Pouteria alnifolia	✓		
Pterocarpus mildbraedii	✓		✓
Rhus longipes	✓		
Ricinodendron heudelotii ssp. africanum	✓		
Rinorea ferruginea	✓		
Rinorea ilicifolia var. ilicifolia	✓		
Rothmannia manganjae	✓		✓
Rothmannia urcelliformis	✓	✓	✓
Sapium ellipticum	✓		✓
Sorindeia madagascarensis	✓	✓	✓
Sterculia sp.	✓		
Strombosia scheffleri	✓	✓	
Synsepalum brevipes	✓	✓	✓
Synsepalum cerasiferum	✓		✓
Tabernaemontana pachysiphon	✓	✓	✓
Tetrapleura tetraptera	✓		
Tricalysia allocalyx	✓		
Tricalysia pallens	✓	✓	
Trichilia dregeana	✓		
Trilepisium madagascariensis	✓		✓
Uvariodendron gorgonis	✓		
Vangueria infausta	✓		
Vepris nobilis	✓	✓	✓
Vepris stolzii	✓		✓
Zanthoxylum usambarense	✓	✓	

To document the avifauna, and assess abundance of understorey forest birds, we conducted audio-visual surveys and mist-net sampling. The loud noise from the waterfalls prior to dam completion prevented quantitative assessments using point counts of the entire avifaunal community. We conducted *ad hoc* observations of birds in microhabitats across elevations at each of these sites, and made a brief foray into the forest above the dam site. We sampled understorey birds for 3456 net-metre-hours (nmh) at four stations in Kihansi (altitudes 520, 630, 760 and 820 m) and two stations in Udagaje gorges (altitudes 510 and 620 m) in three sampling season (June 1998, February 1999 and July 2001). In Kihansi gorge, we compared upper level forest 760 m) with the *Filicium*-dominated patch 820 m) to determine if species richness and composition and capture rates varied between the two habitats. Capture rates are expressed as the number of individuals captured divided by

the mist-net effort pooled over all seasons. Taxonomy follows Zimmerman *et al.* (1996).

Results

Forest birds

We located 69 species of birds that are associated with forest habitats (Table 2). During our sampling period, we failed to detect only one species, Chapin's apalis *Apalis chapini*, which had previously been reported from forest close to the dam site (Rahner 1995). Three species

Table 2. List of forest bird species occurring in the Kihansi and Udagaje forest patches within Njerera FR. Nomenclature follows Zimmerman *et al.* (1996) and forest status broadly follows Bennun *et al.* (1996) with the exception of species marked with a cross (†).

Species	Mist netted	Udzungwas* (m)	Njerere FR (m)	Threat status**
African Black Duck *Anas sparsa*				
African Goshawk *Accipiter tachiro*				
Mountain Buzzard *Buteo oreophilus*		1300–1900	>500	
African Crowned Eagle *Stephanoaetus coronatus*				
Black Sparrowhawk *Accipiter melanoleucus*		1700–1800	>700	
Crested Guineafowl *Guttera pucherani*				
African Finfoot *Podica senegalensis*				
African Green Pigeon *Treron calva*				
Tambourine Dove *Turtur tympanistria*	✓			
Livingston's Turaco *Tauraco livingstonii*				
Yellowbill *Ceuthmochares aereus*				
African Wood Owl *Strix woodfordii*				
Narina Trogon *Apaloderma narina*				
Bar-tailed Trogon *A. vittatum*		800–1800	>700	
African Pygmy Kingfisher *Ispidina picta* †	✓			
Crowned Hornbill *Tockus alboterminatus*				
Trumpeter Hornbill *Bycanistes bucinator*				
Silvery-cheeked Hornbill *B. brevis*				
Moustached Green Tinkerbird *Pogoniulus leucomystax*		1300–1850	>700	
Yellow-rumped Tinkerbird *P. bilineatus*				
Scaly-throated Honeyguide *Indicator variegates* †				
Cardinal Woodpecker *Dendropicos fuscescens* †				
Olive Woodpecker *D. griseocephalus*		1400–1830	>750	
African Broadbill *Smithornis capensis*				
Black Rough-wing *Psalidoprocne holomelas* †				
Little Greenbul *Andropadus virens*	✓			
Shelley's Greenbul *A. masukuensis*	✓	900–1900	>700	
Stripe-cheeked Greenbul *A. milanjensis*	✓	800–1900	>500	
Cabanis's Greenbul *Phyllastrephus cabanisi*	✓	750–1900	>700	
Fischer's Greenbul *P. fischeri*				
Yellow-streaked Greenbul *P. flavostriatus*				
African Hill Babbler *Pseudalcippe abyssinica*		1400–1900	>700	
Eastern Nicator *Nicator gularis*	✓			
White-starred Forest Robin *Pogonocichla stellata*	✓			
Sharpe's Akalat *Sheppardia sharpei*	✓	600–1850	>600	RR
Red-capped Robin-chat *Cossypha natalensis*	✓			
White-chested Alethe *Alethe fuelleborni*	✓			
Orange Ground Thrush *Zoothera gurneyi*	✓			
Olive Thrush *Turdus olivaceus*				
Dusky Flycatcher *Muscicapa adusta*				

Table 2 cont.

Species	Mist netted	Udzungwas* (m)	Njerere FR (m)	Threat status**
Ashy Flycatcher *M. caerulescens*	✓			
Yellow-throated Woodland Warbler *Phylloscopus ruficapilla*		800–1900	>600	
Evergreen Forest Warbler *Bradypterus lopezi*		1300–1900	>750	
Green-backed Camaroptera *Camaroptera brachyura* †	✓			
Black-headed Apalis *Apalis melanocephala*				
Chapin's Apalis *A. chapini* +		1100		VU/RR
White-winged Apalis *A. chariessa*		1000–2000	750	VU/RR
Bar-throated Apalis *A. thoracica*		1400–1900	700	
Yellow White-eye *Zosterops senegalensis*				
Blue-mantled Crested Flycatcher *Trochocercus cyanomelas*	✓			
African Paradise Flycatcher *Terpsiphone viridis* †				
Forest Batis *Batis mixta*	✓			
Black-throated Wattle Eye *Platysteira peltata*				
Black-fronted Bush-shrike *Malaconotus multicolor*				
Fuelleborn's Boubou *Laniarius fuelleborni*				
Black-backed Puffback *Dryoscopus cubla*				
Grey Cuckoo-shrike *Coracina caesia*				
Square-tailed Drongo *Dicrurus ludwigii*				
Waller's Starling *Onychognathus walleri*				
Slender-billed Chestnut-winged Starling *O. tenuirostris*				
Black-bellied Starling *Lamprotornis corrucus*				
Uluguru Violet-backed Sunbird *Anthreptes neglectus*				
Collared Sunbird *A. collaris*	✓			
Olive Sunbird *Nectarinia olivacea*	✓			
Dark-backed Weaver *Ploceus bicolor*				
Red-face Crimson *Cryptospiza reichenowii*	✓	900–1830	>700	
Green-backed Twinspot *Mandingoa nitidula*	✓	750–1000	>600	
Peter's Twinspot *Hypargos niveoguttatus*	✓			
Oriole Finch *Linurgus olivaceus*				

* Altitudinal distributions in Udzungwas from Jensen & Brøgger-Jensen (1992) and updated by Dinesen *et al.* (2001).
** Globally threatened status after Collar *et al.* (1994): VU=vulnerable, RR=restricted range, indicating a global range of less than 50 000 km^2.
† Species not included as forest residents in Bennun *et al.* (1996), but which either reside in rivers traversing through forest or in forest within their Tanzanian range.
+ Only recorded by Rahner (1995).

(Sharpe's Akalat *Sheppardia sharpei*, Chapin's Apalis & White-winged Apalis *A. chariessa*) are globally threatened or range-restricted (range < 50 000 km^2, Collar *et al.* 1994).

Mist-net captures

We captured 269 individuals of 22 species of birds during the three sampling periods over a combined total of 62 208 nmh. This represents an overall capture rate of 44 birds per 10 000 nmh. Species that were most frequently captured overall were Little Greenbul *Andropadus virens* (29% of total captures), Olive Sunbird *Nectarinia olivacea* (19%), Red-capped Robin Chat *Cossypha natalensis* (8%), Stripe-cheeked Greenbul *Andropadus milanjensis* (7%) and Forest Batis *Batis mixta* (6%).

Filicium-dominated forest

Species richness (defined here as number of species), absolute number of individuals captured and species composition were similar between the *Filicium* and Upper Kihansi sites. No significant differences were found in the capture rates between the Upper Kihansi (median=2, 25–75% quartiles=0 and 4 per 10 000 nmh) and *Filicium* (median=2, 25–75% quartiles=1 and 6 per 10 000 nmh) sites (Wilcoxon signed-ranks test, n=15, Z=0.72, p=0.47). This habitat was frequented by mixed-species flocks; many canopy-foragers of the adjacent forest were also seen in large mixed-species flocks in the *Filicium* tree canopies. This habitat appeared particularly important for Uluguru Violet-backed Sunbird *Anthreptes neglectus* and Square-tailed Drongo *Dicrurus ludvigii*.

Forest birds at lower elevations and cold season movements

Several typically submontane and montane forest birds were resident at or above 500 m in the forest of both Kihansi and Udagaje gorges (Table 2). These included Mountain Buzzard *Buteo oreophilus*, Black Sparrowhawk *Accipiter melanoleucus*, White-chested Alethe *Alethe fuelleborni*, Sharpe's Akalat, African Hill Babbler *Pseudalcippe abyssinica*, Orange Ground Thrush *Zoothera gurneyi*, White-starred Robin *Pogonocichla stellata*, Cabanis's Greenbul *Phyllastrephus cabanisi*, Shelley's Greenbul *Andropadus masukuensis*, Stripe-cheeked Greenbul, Yellow-throated Woodland Warbler *Phylloscopus ruficapilla*, Black-fronted Bushshrike *Malaconotus multicolor* and Red-faced Crimsonwing *Cryptospiza reichenowii*. The following species were only recorded below 700–750 m in the 1998 and 2001 cold seasons, but not the 1999 hot season: Olive Woodpecker *Dendropicos griseocephalus*, Moustached Green Tinkerbird *Pogoniulus leucomystax*, White-chested Alethe, White-starred Robin, White-winged Apalis, Bar-throated Apalis *Apalis thoracica*, Evergreen Forest Warbler *Bradypterus lopezi*, Grey Cuckoo-shrike *Coracina caesia*.

Other notable records

African Black Duck *Anas sparsa*

Numerous singles and pairs were seen above the dam site along the Kihansi River in February 1999 (1100 m), but it was rarely observed in the upper parts of the Kihansi gorge (800–1000 m). This species is generally noted from above 1800 m in the Udzungwas (Jensen & Brøgger-Jensen 1992).

African Finfoot *Podica senegalensis*

Quite commonly observed as singles or threes in rapids above the dam site on the Kihansi River. A total of about seven birds were seen on 26 February 1999, at 1100 m, along a 1 km stretch of river.

Eurasian Hobby *Falco subbuteo*

Approximately 40–50 of these raptors, together with other unidentified falcons, were observed on 26 February 1999. They were foraging on

swarming termite alates at dusk and late into the evening hours by the light of large works spotlights at the dam site.

Half-collared Kingfisher *Alcedo semitorquata*

This species was regularly encountered along all small streams and rivers below 600 m.

African Pygmy Kingfisher *Ispidina picta*

Regularly observed and/or netted in forest habitats in the cold seasons of 1998 and 2001, but also infrequently observed in the hot season of 1999.

Moustached Green Tinkerbird *Pogoniulus leucomystax*

There is only one previous record of this tinkerbird species occurring at low elevations, namely at 450 m in Kwenhondwe forest, West Usambaras (Stuart & Jensen 1981). To this we add our records of presumed cold seasonal movements down slope at Njerere FR.

Cliffchat *Thamnolea cinnamomeiventris*

A pair of these birds was seen courting in very rocky terrain at 350 m, at the base of Udagaje gorge in July 2001. This represents the lowest altitudinal record for the species in eastern Africa (lowest reported is 600 m, Britton 1980).

White-winged Apalis *Apalis chariessa*

At least two birds identified clearly in a large mixed species flock at Udagaje gorge on 14 June 1998. As it regularly occurs at 1000–1500 m in the Udzungwas, our record at 750 m is probably the lowest for this mountain range.

Uluguru Violet-backed Sunbird *Anthreptes neglectus*

Not uncommon in mixed species flocks at all elevations in Udagaje and Kihansi gorges.

Black-bellied Starling *Lamprotornis corrucus*

Four observed once only at 650 m in forest at Udagaje Gorge. There are few records of this species in the Udzungwa foothills (http://tanzaniabirdatlas.com/atlas.htm).

Discussion

Despite intense coverage of all six sites in the two gorges, mist-netting capture rates were much lower in Njerera FR than in other Eastern Arc forests at similar elevations. For example, Evans and Anderson (1992) report a capture rate of 130 birds per 10 000 nmh from similar elevations in Mtai Forest Reserve, East Usambaras, which was both considerably larger and wetter than Njerera. The low capture rates can be attributed to the drier forest floor in Njerera FR (where productivity is probably not very high), the small size of the two forests, steepness of terrain, and habitat disturbance. The latter was particularly noticeable in Udagaje gorge and the upper levels of Kihansi where fires have encroached on the forest in the past.

Few globally threatened or restricted-range species occurred in this reserve. Of those that did, all occurred at very low abundances as

judged from capture rates or frequency of encounters. Probably as a result of their low abundances, two such species (Uluguru Violet-backed Sunbird and Sharpe's Akalat) were missed by Rahner (1995) but were added by us in 1998 and consistently recorded thereafter. Low abundances of threatened and restricted-range species may be explained by the same factors as discussed above; specifically, poor habitat quality and small forest size (Newmark 2002). However, rarity of these species may be compounded by the fact that the forest is below their optimal altitudinal ranges in the Udzungwas (Table 1).

We found no differences in understorey bird species composition and abundance between the Upper Kihansi forest and the *Filicium*-dominated patch. Our result differs from that of Fjeldså (1999), in which he found that disturbed habitats (in which *Filicium*-dominated forest is included) adjacent to primary forest in the Udzungwas held lower abundances of forest understorey specialists, as well as some larger canopy insectivores. We found that the *Filicium* habitat at Kihansi seems to be important for most bird species, including a few forest-interior and understorey species. While our data are too limited to assess the abundance of forest understorey specialists in disturbed versus undisturbed tracts, the presence of mixed-species flocks in the upper canopy of *Filicium* trees at Kihansi is different to Fjeldså's (1999) study in which he noted that mixed-feeding parties were absent or very infrequent in disturbed habitats. Two flocking species, Square-tailed Drongo and Uluguru Violet-backed Sunbird, commonly foraged in this habitat in both seasons at Kihansi. It is possible that the proximity of *Filicium* forest to the mixed forest in Kihansi allowed forest specialists to 'spill over' and enrich this disturbed forest type in comparison to Fjeldså's study sites in which a broader array of disturbed vegetation types was sampled.

A notable feature of Njerera was the presence of typical submontane and montane birds resident at low abundances from 500 to 800 m. Lovett *et al.* (1997) found upper elevation trees, for example *Olea capensis, Allanblackia stuhlmannii* and *Cephalosphaera usambarensis*, in the Kihansi gorge and attributed this to the cool microclimate caused by spray from waterfalls. Elsewhere in the Eastern Arc, in the East Usambaras, moisture from the ocean is augmented by orographic rainfall and is therefore high at lower elevations, such that submontane trees and birds associated with this forest type occur lower down than is typical (Moreau 1966, Stuart 1983). Njerera FR is similar, except that orographic rainfall is augmented by mist from the large waterfalls, capturing sufficient moisture in the gorges to encourage growth of submontane and montane plants. The unique local climate could thus influence the presence of some submontane forest birds.

Small forest patches such as those in Njerera FR that form outliers along the Udzungwa scarp and other Eastern Arc Mountain ranges may maintain low abundances of forest birds due to their small size and

drier forest conditions, among other factors. Nonetheless, these forests are important as they could serve as potential stepping-stones for dispersal between larger patches, and as many are often in the adjacent lowlands, they could serve as important post-dispersal sites for montane species (Burgess & Mlingwa 2000). The presence of several submontane species in the cold but not the hot season, and the presence of these taxa below 700 m in the cold season only, indicates that low-lying forests like Njerera FR may be important cold season refuges. There are numerous such forests throughout the Eastern Arc Mountains that remain to be explored ornithologically, and we therefore recommend future workers to visit these remote patches in different seasons to evaluate what species occur there and whether or not they are important cold season refugia for highland birds.

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A preliminary survey of the avifauna of Eminit Forest, Loima Hills, western Turkana District

Marc Baker

Eminit Forest, located in the Loima Hills of northern Kenya, is an essential part of the grazing lands of the Turkana people. The Turkana people are sub-divided into 17 groups, with five of these groups, the Ngisir, Ngimonia, Ngikamatak, Wayakwara and Lukumong, depending on the Loima ecosystem for dry season grazing (Oba 2001). Through tribal agreements the Turkana people have created an indigenous land-use system which is enforced by the tribal chiefs and adhered to the majority of the time. Eminit forest not only provides dry season grazing but also a refuge during periods of tribal instability and sporadic clashes that occur between the Turkana and Karamajong. As reported by Barrow (1988) and Oba (2001) the conservation of biodiversity at this site is not related to external management but indigenous knowledge and land-use, which has evolved out of a need to protect the natural resource for use during times of environmental stress and tribal instability. In terms of their effect on localised rainfall patterns and water catchment, the Loima Hills, and Eminit Forest in particular, are extremely valuable to the local pastoralist inhabitants as well as resident and migratory fauna.

The main aims of this survey were to establish a bird species list and note any species of conservation concern that may occur in the forest. An assessment of the threats to those species was made as part of a report for the UNDP/GEF Crossborder Biodiversity Project which was conducting a forest conservation project in the district.

Study site

The Loima Hills (also known as Murua Ngithigerr) are situated at 03°30′N, 35°00′E covering an area of approximately 160 km^2. Combined with the Puch Prasir plateau they cover a total area of 3000 km^2, representing one of the most extensive highland areas in Turkana District. Eminit Forest is situated on the Loima Hills plateau, from an altitude of 2050 m to a forested peak on its southern edge at 2286 m. The forested plateau is 9 km at its widest point (east to west axis), 15.8 km at its longest point (north to south axis) and covers an area of approximately 83 km^2 (all values measured from 1:250 000 map, series Y503, sheet NA–36–4, 1975). The lower slopes of the Loima Hills are accessed by bush road, a distance of 55 km east-north-east of Lodwar,

the provincial capital of Turkana District. Approximately 9 km (10%) of the western edge of Eminit Forest is located in Kenya bird atlas square 12D, the remainder being located in square 13C (Lewis & Pomeroy 1989).

The forested plateau is relatively flat with an altitudinal range of only 200 m over an area of 83 km^2, but the edges of the Loima Hills consist of steep slopes and cliffs which create an irregular drainage pattern over bare rock. Although there are more established drainage lines, no flowing water was observed in May 2001. The west and north-west slopes of the Loima Hills drain into the upper Tarach catchment system, the south and south-east areas into the Kosipur-Turkwell catchment and the Kaulathe-Turkwell catchments system drains the north-eastern slopes of the mountain (Barrow 1988).

The vegetation of the Loima Hills area is related to elevation more than terrain. The lower slopes largely comprise *Aristida mutabilis* and *Acacia mellifera* with *Acacia tortilis* dominating the vegetation along seasonal water courses and drainage lines. The soils are generally rocky and composed of euteric outcrops and calcic cambisols. The dry montane forest is dominated by *Juniperus procera, Olea europea, Olea capensis, Tecla nobilis* and *Podocarpus falcatus,* while the sparse undergrowth is composed of *Maytenus heterophylla, Dombeya goetzenii* and *Pistacia aethiopica* (Barrow 1988). The forest interior comprises mainly *Podocarpus falcatus* with *Juniperus procera,* with the latter dominating along ridges. These dominant species form a loose canopy at an estimated 25–30 m, with *Olea europea* and *O. capensis* forming a sub-canopy at an estimated 10–15 m. In approximately 65% of the forest visited, there was very little undergrowth, with saplings forming much of the vegetation structure between ground level and 5 m. There were occasional shrubs where breaks in the canopy had allowed light to penetrate, forming islands of forest edge habitat within the forest.

Large amounts of dead wood and leaf litter covered the forest floor providing a micro-environment for large numbers of invertebrates. Much of this dead wood seemed to be very old and the rate of decomposition slow which is possibly linked to the lack of moisture.

Methods

A combination of mist-netting, timed species counts (TSCs) and *ad hoc* observation were used to survey the avifauna in Eminit Forest over a period of ten days from the 30 April to 9 May 2001. Mist netting was carried out from 06:00 to 12:00 and 16:00 to 18:30. All birds caught were fitted with a standard Museum of Nairobi ring and the following biometric measurements were taken: tarsus, wing, bill, tail length and weight. These data, along with brood patch (six point scale from 0=none to 5=full) and moult data were deposited with the National Museum of Kenya, Nairobi.

Timed species counts were carried out in the mornings between 07:00 and 09:00 in forest, and between 18:00 and 19:00 at forest edge. Two counts were carried out each morning, the first being at a randomly selected point along a path, at least 500 m into forest. The second count was carried out 300 m (and no more than 15 minutes walk) from the first point in a direct line walked on a easterly compass bearing.

Only birds within a fixed radius of 25 m (estimate of error is 3 m, 12%) and 3 m above the ground were recorded. Each point was sampled for 40 minutes with observations being allocated to 5 minute time intervals giving scores of between 0 and 8 over the sample period. All other methods followed Bennun and Waiyaki (1992) All counts were made by the same two observers (Marc Baker and Njano Mbilinyi)

The results from Loima were compared with those from other northern dry montane forests, in particular Kulal and Njiru (Borghesio pers. comm.) and Moroto (Davenport *et al.* 1996). The main aim was to look at the similarity of these sites in terms of the avifauna known to occur, using Bray-Curtis cluster analysis. This uses group-average clustering to give a hierarchy of clusters indicating similarity as a percentage. The analysis concentrates on the forest dependant avifauna (both forest specialist and forest generalist) as defined by Bennun *et al* 1996.

Results and discussion

A total of 87 species were recorded, representing 40 families and including three species of conservation concern (Bennun & Njoroge 1996). A full list is shown in the appendix. Of these 87 species, 48 were recorded in Eminit Forest and at forest edge (above 2050m), whilst the remainder were recorded in the dry Acacia woodland between 800 m (at the foot of the Loima Hills) and 2050 m.

Mist netting

A total of 2616 net-metre-hours (nmh) were completed over a five-day period, in which 13 birds were caught and processed (Table 1). The low number of captures reflects the low effort but also the low capture rate of 0.004 birds per nmh. This was probably due to the lack of a shrub layer within the forest which would normally help conceal the nets.

Table 1. Results from mist-netting in Eminit Forest.

Species	Ecol. Type	No. caught	Rank
White-eyed Slaty Flycatcher	F	3	1
Scaly-throated Honeyguide	f.	2	2
Grey-backed Camaroptera	f.	2	2
Brown Woodland Warbler	F	1	3
Yellow White-eye	f.	1	3
Brown-headed Tchagra	Fe	1	3
Cape-Robin Chat	f.	1	3
Amethyst Sunbird	f.	1	3
Variable Sunbird	f.	1	3

Almost all of the birds caught and ringed were forest species: two forest generalists (F), six forest users (f.) and one forest edge (fe) species.

Timed species counts

A total of 16 TSCs were carried out in forest interior and forest edge, giving a species list and index of relative abundance for each habitat type. The results for the timed species counts are shown in Tables 2 and 3 which indicate the commonest canopy and mid-stratum species in both the forest interior and forest edge.

In the forest interior, ten TSCs were carried out during which 13 species were recorded (Table 2). African Goshawk *Accipiter tachio*, Olive Pigeon *Columba arquatrix*, Narina Trogon *Apaloderma Narina* and Brown Woodland Warbler *Phylloscopus umbrovirens* were recorded only in forest interior.

Table 2. Results of timed species counts in forest interior, Eminit Forest.

Species	Ecol. Type	TSC Index	Rank
Brown Woodland Warbler	F	4.0	1
Olive Thrush	F	2.0	2
Grey-backed Camaroptera	f.	1.9	3
Dusky Flycatcher	F	1.4	4
White-eyed Slaty Flycatcher	F	0.9	5
Grey Cuckoo Shrike	FF	0.8	6
Amythst Sunbird	f.	0.8	6
Yellow White-eye	f.	0.8	6
Olive Pigeon	F	0.7	7
Dusky Turtle Dove	f.	0.7	7
African Goshawk	F	0.6	8
Common Bulbul	f.	0.5	9
Narina Trogon	F	0.2	10

At forest edge, six TSCs were carried out in which 15 species were recorded (Table 3). Variable Sunbird *Cinnyris venusta*, Cape Robin-Chat *Cossypha caffra*, Baglafect Weaver *Ploceus baglafect*, Northern Puffback *Dryossvopus gambensis*, Paradise Flycatcher *Terpsiphone viridis* and Yellow-crowned Canary *Serinus canicollis* were all recorded only at forest edge.

Table 3. Results of timed species counts along forest edge, Eminit Forest.

Species	Ecol. Type	TSC Index	Rank
Variable Sunbird	f.	5.3	1
Amethyst Sunbird	f.	4.5	2
Yellow White-eye	f.	3.6	3
Common Bulbul	f.	3.6	3
Cape Robin Chat	F	3.5	4
Baglafect Weaver	f.	2.6	5
Olive Thrush	F	2.6	5
Northern Puffback	F	1.3	6
Grey-backed Camaroptera	f.	1.3	6
Grey Cuckoo Shrike	FF	1.1	7
Paradise Flycatcher	F	1.1	7
Yellow Crowned Canary	f.	1.1	7
Dusky Flycatcher	F	0.6	8
White-eyed Slaty Flycatcher	F	0.6	8
Dusky Turtle Dove	f.	0.3	9

Species accounts

Great Sparrowhawk *Accipiter melanoleucus* (dark morph) was recorded four times carrying food in the same direction at dusk and thus suspected to be breeding. As all observations of this species were of a dark morph in the same location at approximately the same time it was presumed that this was the same individual.

Peregrine Falcon *Falco peregrinus* was recorded daily at dusk hunting over grassland. The presence of cliffs which this species requires for breeding make it likely that this was a resident bird. Heavy streaking on the breast indicated that this was a sub-adult bird.

White-crested Turaco *Tauraco leucolophus* was recorded in forest edge and riverine forest as low as 1800 m. It was absent from the forest interior and the dry woodland below 1800 m.

African Hill Babbler *Alcippe abyssinica* was recorded throughout the forested plateau. Cunningham-van Someren and Schifter (1981) described a separate race for Loima (*loima*) based on collections made by Joseph Mwaki in 1962.

Olive Thrush *Turdus olivaceus* was observed throughout habitat types above 2000 m, where it was recorded feeding in the ground layer, sub-canopy and canopy. This is usually a bird of the ground and shrub layer, so it is thought that the absence of a shrub layer combined with a lack of resource competition from greenbuls and hornbills (see below) may have allowed this species to occupy the canopy layer. Cunningham-van Someren and Schifter (1981) make reference to the sharp division between the extremely pale birds from Loima, Morongole, Karissia, Nguruman Range and those from other areas.

Brown Woodland Warbler *Phylloscopus umbrovirens* was the commonest bird in the forest interior (see TSC results, Table 2). A bird usually associated with shrub layer and small trees, this species predominantly occupied the sub-canopy and canopy, and was often recorded crawling through the *Juniperus-Podocarpus* canopy at over 30 m.

Cinnamon Bracken Warbler *Bradypterus cinnamomeus* was recorded twice in the undergrowth of forest clearings created by felled trees and undergrowth along drainage lines within the forest interior.

Baglafect Weaver *Ploceus baglafect emini*, is distributed in woodland and marsh between 800 m and 1200 m from north-west Uganda east to the Loima Hills. It was recorded in forest edge and clearings where it was relatively abundant (see TSC results, Table 3); several juvenile birds were also recorded.

Large numbers of swifts mainly African Black Swift *Apus barbatus* (estimates of flock size over 250 individuals) but also significant numbers of Alpine *A. melba* and Mottled Swift *A. aequatorialis* (estimates of flock size over 50 individuals) were recorded daily, feeding above grassland and along the edges of cliffs. Nyanza Swift *A. niansae* was observed daily in mixed species flocks, but in considerably lower

numbers than other members of this family (usually 3–4). Common House Martin *Delichon urbica* were present in low numbers, often in mixed flocks.

Comparison with other northern montane forests

A comparison was made of species that have been recorded in the similar northern dry montane forests of Kulal and Njiru (Borghesio pers. comm.) and Moroto (Davenport *et al.* 1996). This comparison was based on the forest dependant species (forest specialist FF, and forest generalist F) for each site. Loima had 19 species, Moroto 28, Kulal 16 and Njiru 26. When looking at the similarity of these sites, all mountains showed a high percentage in the similarity of their species composition, the highest being shown by Moroto and Loima (68%) and the least by Moroto and Kulal (55%, Table 4).

Table 4. Similarity matrix showing the percentage similarity between the montane forest sites.

Similarity Matrix

	Moroto	Njiru	Kulal
Loima	68.0851	66.6667	51.4286
Kulal	54.5455	66.6667	*
Njiru	62.963	*	*
Moroto	*	*	*

The only species so far recorded at all of these sites were: Mountain Buzzard *Buteo oreophilus*, Red-chested Cuckoo *Cuculus solitarius*, Narina Trogon, African Hill Babbler *Pseudoalcippe abyssinica*, Olive Thrush, Brown Woodland Warbler and Northern Puffback. The similarity between Moroto and Loima is influenced by the presence of two species in particular that have not been recorded at Kulal and Njiru, namely Tambourine Dove *Turtur tympanistria* and African Wood Owl *Ciccaba woodfordii*. Clearly, Moroto has the greatest diversity of forest dependant species (n=28), with eight occurring only at that site. At Njiru (n=26) there are four species unrecorded from Kulal and Loima, all species typical of dry montane forests.

There were several groups of birds that were conspicuous by their absence from Eminit. No members of the genus Apalis were recorded. Yellow-breasted Apalis *Apalis flavida*, a bird of woodland and forest edge, was expected to occur, and this absence may be linked to isolation, as it has not been recorded in the arid woodland of north-western Kenya (Zimmerman *et al.* 1996). The absence of Grey Apalis *Apalis cinerea*, an active bird found in the canopy of similar montane forest, cannot be linked to habitat variables. It would almost certainly have been recorded were it present. Chestnut-throated Apalis *Apalis porphyrolaema* has been recorded in Moroto and in isolated montane forests south of Loima. The absence of any greenbuls, Cabanis's Greenbul *Phyllastrephus cabanisi* in particular, is odd. Resource

availability does not appear limited for an insectivorous bird such as this, which does occur on Moroto, Kulal and Njiru. This species is commonly caught in mist-nets so should have been recorded if present. Yellow-whiskered Greenbul *Andropadus latirostris* is another likely species that was not recorded. This bird is predominately frugivorous and very few sub-canopy fruiting shrubs or trees were noted. Northern Brownbul *Phyllastrephus strepitans*, a bird of woodland and forest edge, was also expected to occur since the habitat and resource availability would seem to suit this species. Silvery-cheeked Hornbill *Bycanistes brevis* was not recorded despite the presence of fruiting figs and the large trees required for nesting by this species. The absence of White-starred Forest Robin *Pogonocichla stellata* is unusual because this species is found in the lower stratum of these forest types and occurs on many isolated forest islands in Kenya and Tanzania, supporting the fact that this species has a good ability to disperse. Abyssinian Ground Thrush *Zoothera piaggiae* occurs on Kulal, Njiru and Moroto but is absent at Loima.

There are several reasons why these species may be missing including: 1) they were missed by the survey team, although this is unlikely for those species which are vocal or gregarious (e.g. some of the apalises); 2) some aspect of the habitat was unsuitable. The stratification of the vegetation seemed to have a large impact on avian diversity, and the feeding ecology of many of the bird species. Many of the species normally associated with undergrowth were notably absent, while insectivorous and omnivorous species one would normally associate with undergrowth were regularly observed in the sub-canopy and canopy. 3) they have been unable to colonise the site due to poor dispersal ability and/or lack of historical habitat connectedness.

White-browed Robin-Chat *Cossypha heuglini* was collected in the Loima Hills in 1962 by Joseph Mwaki for A.D. Forbes-Watson, but was not recorded during the current survey.

Threats and conservation recommendations

The threats to biodiversity at this site are varied. Firstly, the presence of fire arms has almost certainly greatly reduced wildlife populations. Although dikdik are fairly common, these were the only "large" mammals that were observed in the acacia woodland. It is unlikely that opportunistic hunting with firearms would affect the avifauna as the cost of a single round would not be justified by the meat gained. However, gunfire was heard several times during this two week survey suggesting that ammunition was not hard to obtain.

The large amounts of fuel wood still available around the Loima Hills and within Eminit Forest would indicate that felling trees for firewood by local people is not a cause of concern. Within Eminit Forest there were no signs of felling for fuelwood or timber, though several trees had been burnt for wild honey. In a couple of instances, *Podocarpus*

falcatus were felled for seemingly no apparent reason other than to allow light through to the forest floor and create grazing for future use.

The major conservation concern encountered was charcoal production. This activity is mainly restricted to the *Acacia tortillis* riverine woodland running from the Loima Hills east to Lodwar. The demand for charcoal is generated in Lodwar where the increasing population has led to an increased demand for fuel.

The indigenous land-use system previously outlined, is born of an understanding of the need for dry season grazing (for herbaceous production levels see Barrow 1988). The land-use systems that are in place are designed around a model of sustainability to ensure that this resource is protected in perpetuity for times of environmental stress. In terms of the conservation of biodiversity, the current land-use system would seem to be beneficial with the current land-users also being its guardians. However, as stated by Barrow (1988), the presence of a legal framework that acknowledges the current land-use system as well as allowing a measure of protected status is essential. Whereas definitions of protected areas such as Game Reserve, National Reserve and Biosphere Reserve are based on the exclusion of people and preservation of the natural resource to varying degrees, the best option for Loima would be a Forest Conservation Reserve with its own rules and regulations (Barrow 1988).

Conclusions

This preliminary survey shows Eminit Forest to have a relatively poor avifaunal diversity with only 19 forest dependent species of which four are forest specialists. Due to its northerly location it does represent an isolated outlier of this montane forest type, and as with other isolated mountains, Eminit represents an important refuge for the movement of birds as well as other wildlife and people. Although only four forest specialist species have so far been recorded at this site, Eminit Forest's effect on local rainfall patterns, water drainage and thus vegetation biomass over a large area is clear (Barrow 1988, Amuyunzu & Oba 1991). As such, Eminit Forest is of significance for many species of birds and wildlife that, although they are not truly forest dependant species, are very much dependant on the presence of the forest.

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Appendix

Bird species recorded from the foot of Loima Hills at 800m to the forested plateau at 2100m. Taxonomic order follows EANHS (1996) with their number indicated. The Kenyan bird atlas square number is given for each species following Lewis & Pomeroy (1989). Those species which are of particular conservation significance are indicated as: RNT=Regionally Near Threatened, RVu=Regionally Vulnerable and RR=Regionally Restricted (Bennun and Njoroge 1996). Ecological type for forest birds follows Bennun *et al.* (1996); FF=forest specialist, F=forest generalist and f.=forest visitor. The remaining non-forest birds are categorised as follows: W=Widespread, Wd=Woodland, G=Grassland and Fe=Forest edge. Breeding records are indicated as: SusBr=Suspected breeding and Br=Confirmed breeding.

No	Family / English name	Scientific name	Ecol. type	Atlas sq.	Status
Accipitridae					
101	Swallow-Tailed Kite	*Chelictinia riocourii*	Wd	13C	
102	Black Kite	*Milvus migrans*	G	13C 12D	
117	Harrier Hawk	*Polyboroides typhus*	f.	13C 12D	
125	African Goshawk	*Accipiter tachio*	F	13C	
127	Shrika	*Accipiter badius*	f.	13C	
134	Great Sparrowhawk	*Accipiter melanoleucus*	F	13C 12D	
139	Mountain Buzzard	*Buteo oreophilus*	FF	13C 12D	RNT
142	Augur Buzzard	*Buteo augur*	W	13C	
158	Martial Eagle	*Polemaetus bellicosus*	W	13C	RVu
159	Pygmy Falcon	*Polihierax semitorquatus*	Wd	13C	
162	Peregrine Falcon	*Falco peregrinus*	Fe	13C 12D	
166	African Hobby	*Falco cuvieri*	F	13C 12D	
174	Fox Kestrel	*Falco alopex*	Wd	13C	
Phasianidae					
190	Crested Francolin	*Francolinus sephaena*	Wd	13C	
Glareolidae					
257	Somali Courser	*Cursorius somalensis*	Wd	13C	
Columbidae					
357	Tambourine Dove	*Turtur tympanistria*	F	13C 12D	
359	Emerald-spotted Wood Dove	*Turtur chalcospilos*	f.	13C	
365	Olive Pigeon	*Columba arquatrix*	FF	13C	
366	Speckled Pigeon	*Columba guinea*	Wd	13C	
371	Mourning Dove	*Streptopelia decipiens*	Wd	13C	
376	Dusky Turtle Dove	*Streptopelia lugens*	f.	13C 12D	
Musophagidae					
399	White-crested Turaco	*Tauraco leucolophus*	f.	13C 12D	
401	White-bellied Go-away-bird	*Corythaixoides leucogaster*	Wd	13C	
Cuculidae					
409	Red-chested Cuckoo	*Cuculus solitarius*	F	13C 12D	
417	Emerald Cuckoo	*Chrysococcyx cupreus*	F	13C 12D	
419	Klaas's Cuckoo	*Chrysococcyx klaas*	F	13C 12D	
422	White-browed Coucal	*Centropus superciliosus*	Fe	13C	
Strigidae					
444	Wood Owl	*Ciccaba woodfordii*	F	13C	
Caprimulgidae					
449	Montane Nightjar	*Caprimulqus poliocephalus*	F	13C 12D	
460	Slender-tailed Nightjar	*Caprimulqus clarus*	Wd	13C	

Apodidae					
471	African Black Swift	*Apus barbatus*	W	13C 12D	
473	Nyanza Swift	*Apus niansae*	W	13C 12D	
475	Mottled Swift	*Apus aequatorialis*	W	13C 12D	
476	Alpine Swift	*Apus melba*	W	13C 12D	
Coliidae					
482	Blue-naped Mousebird	*Urocolius macrourus*	Wd	13C	
Trogonidae					
484	Narina Trogon	*Apaloderma narina*	F	13C 12D	
Meropidae					
505	White-throated Bee-eater	*Merops albicollis*	f.	13C	
Coraciidae					
518	Abyssinian Roller	*Coracias abyssinica*	Wd	13C	
Upupidae					
542	Hoopoe	*Upupa epops*	Wd	13C	
Phoeniculidae					
532	Abyssinian Scimitarbill	*Rhinopomastus minor*	Wd	13C	
Bucerotidae					
539	Eastern Yellow-billed hornbill	*Tockus flavirostris*	Wd	13C	
Capitonidae					
564	Red-fronted Tinkerbird	*Pogoniulus pusillus*	Fe	13C	
582	Red-and-yellow Barbet	*Trachylaemus erythrocephalus*	Wd	13C	
583	d'Arnaud's Barbet	*Trachylaemus darnaudii*	Wd	13C	
Indicatoridae					
585	Scaly-throated Honeyguide	*Indicator variegatus*	f.	13C 12D	Br. (Juv)
Picidae					
601	Nubian Woodpecker	*Campethera nubica*	Fe	13C	
610	Cardinal Woodpecker	*Denropicos fuscescens*	Wd	13C	
Hirundinidae					
669	Common House Martin	*Delichon urbica*	W	13C 12D	
Pyconotidae					
729	Common Bulbul	*Pycnonotus barbatus*	f.	13C	
Timaliidae					
737	African Hill Babbler	*Pseudoalcippe abyssinica*	FF	13C	
746	Rufous Chatterer	*Turdoides rubiginosus*	Wd	13C	
Turdidae					
769	Cape Robin-Chat	*Cossypha caffra*	f.	13C	
772	White-browed Robin Chat	*Cossypha heuglini*	f		*
786	White-browed Scrub Robin	*Cercotrichas leucophrys*	Wd	13C	
816	Olive Thrush	*Turdus olivaceus*	F	13C 12D	
Muscicapidae					
831	Dusky Flycatcher	*Muscicapa adusta*	F	13C	Br.
840	White-eyed Slaty Flycatcher	*Melaenornis fischeri*	F	13C	RR,SusBr.
844	African Grey Flycatcher	*Bradornis microrhynchus*	Wd	13C	
Sylviidae					
876	Brown Woodland Warbler	*Phylloscopus umbrovirens*	F	13C 12D	
884	Cinnamon Bracken Warbler	*Bradypterus cinnamomeus*	F	13C	
930	Grey Wren Warbler	*Calamonastes simplex*	Wd	13C	
933	Grey-backed Camaroptera	*Camaroptera brachyura*	f.	13C	Br.
963	Red-faced Crombec	*Sylvietta whytii*	Wd	13C	

971	Yellow-vented Eremomela	*Eremomela flavicrissalis*	Wd	13C	
Zosteropidae					
983	Yellow White-eye	*Zosterops senegalensis*	f.	13C 12D	
Remizidae					
990	White-bellied Tit	*Parus albiventris*	f.	13C	
Monarchidae					
1007	Paradise Flycatcher	*Terpsiphone viridis*	f.	13C 12D	Br. **
Platysteiridae					
1013	Chin-spot Batis	*Batis molitor*	Fe	13C	
Laniidae					
1043	Common Fiscal	*Lanius collaris*	G	13C	
Malaconotidae					
1048	Brown Crowned Tchagra	*Tchagra australis*	Fe	13C	
1070	Slate-coloured Boubou	*Laniarius funebris*	G	13C	
1071	Northern Puffback	*Dryoscopus gambensis*	F	13C 12D	Br.
1080	Grey Cuckoo-shrike	*Coracina caesia*	FF	13C	SusBr.
Dicruridae					
1082	Common Drongo	*Dicrurus adsimilis*	Wd	13C	
Corvidae					
1097	Fan-tailed Raven	*Corvus rhipidurus*	G	13C	
Sturnidae					
1126	Magpie Starling	*Speculipastor bicolor*	Wd	13C	
Nectariniidae					
1135	Eastern Violet-backed Sunbird	*Anthreptes orientalis*	Wd	13C	
1149	Amethyst Sunbird	*Nectarinia amethystina*	f.	13C	Br.
1152	Variable Sunbird	*Nectarinia venusta*	f.	13C	Br.
Passeridae					
1190	Yellow-spotted Petronia	*Petronia pyrgita*	Wd	13C	
Ploceidae					
1193	White-headed Buffalo Weaver	*Dinemellia dinemelli*	Wd	13C	
b1205	Baglafecht Weaver	*Ploceus baglafect*	f.	13C 12D	Br.
1226	Vitelline Masked Weaver	*Ploceus velatus*	Wd	13C	
1247	Red-headed Weaver	*Anaplectes rubriceps*	Wd	13C	
Estrilididae					
1311	Purple Grenadier	*Uraeginthus ianthinogaster*	Wd	13C	
Fringillidae					
1332	Yellow-crowned Canary	*Serinus canicollis*	f.	13C	
1336	White-bellied Canary	*Serinus dorsostriatus*	Wd	13C	
Emberizidae					
1352	Cinnamon-breasted Rock Bunting	*Emberiza tahapisi*	Wd	13C	

* Collected J.Mwaki for A.D.Watson (1962)
** White and rufous morphs occur

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Some interesting bird observations from Northern Kenya

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Kenya is one of the best-known countries in Africa ornithologically, and there is a wealth of information on the distribution, ecology and conservation of its bird fauna, which presently stands at 1080 species (Britton 1980, Brown & Britton 1980, Lewis & Pomeroy 1989, Zimmerman *et al.* 1996, Bennun & Njoroge 1999). However, most of the information comes from the more easily accessible provinces of the central and southern part of the country, while the Northern provinces, where roads and facilities are often lacking or very scarce, have been studied much less thoroughly. For instance, in the Bird Atlas of Kenya (Lewis & Pomeroy 1989) the average coverage was estimated to be less than 30% in only 29% of the squares south of 01°N, but as many as 57% of the squares north of this line. Although some additional information has been added in the 1990s (Oyugi 1994, Ndang'ang'a & Borghesio 1999, Borghesio & Ndang'ang'a 2000 and 2001), the situation has not changed much in recent years, and northern Kenya is still poorly known from the ornithological point of view.

In this paper we report some interesting bird observations that we have gathered during several visits to northern Kenya between 1997 and 2004. These observations serve to clarify the biology, distribution and movements of some poorly-known and rare African and Palaearctic birds.

Study area

The observations reported in this paper were recorded in an area of about 20 000 km^2 in northern Kenya, between the southern end of Lake Turkana (NW), Marsabit National Park (NE) and Leroghi forest (South) (Figure 1). The region is mainly arid, with average rainfall mostly below 500 mm/year (White 1983) and altitude usually below 1000 m. However, most of the observations were made in the "islands" of montane forest habitat that cover less than 2% of the total land surface (Wass 1995). These forests are located on isolated mountain massifs rising sharply from the surrounding plains. These mountains receive substantially higher amounts of rain (in the order of 1000 mm/year, White 1983), allowing the development of dense, mostly continuous canopy, forest, dominated by trees such as *Podocarpus gracilior, Juniperus procera, Cassipourea malosana* and *Olea africana.* One of the forests

(Marsabit) is noteworthy for having within it a substantial freshwater lake (Lake Paradise) occupying the crater of an extinct volcano. The names and co-ordinates of all localities cited in the text are listed in Table 1. Systematics follow EANHS (1996). Wing measurements were made using method three of Svensson (1992). We also followed this author's instructions for tarsus measurements.

Species accounts

Mallard *Anas platyrhynchos.* The only previous reliable record of this species in Kenya dates back to February 1929, when one bird was shot at Lake Paradise, Marsabit (Zimmerman *et al.* 1996). There is also another unsubstantiated record from the Kenyan section of Lake Turkana in the mid-1980s (Stevenson & Fanshawe 2002). However, Mallard is a regular visitor to the Ethiopian lakes during winter (Urban & Brown 1971).

We observed a flock of nine individuals of this species at Lake Paradise (the same location as the 1929 record), from 29 November to 3 December 2002. It was not possible to reliably sex the birds, as all males appeared to be in eclipse plumage at the time of the observations. However, the species could be recognised by the combination of dull orange bill, orange legs, dark brown lore, crown and eye-stripe, and lack of white markings on the wing. Although the evidence is still scanty, our observation suggests that Mallard might be a regular, perhaps annual, winter visitor to northern Kenya.

Booted Eagle *Hieraaetus pennatus.* This is an uncommon winter visitor to Kenya, mostly between October and April. Very few records are known from the northern part of the country, where it is thought to be only a passage migrant (Lewis & Pomeroy 1989).

During our surveys we made numerous observations of this species detailed as follows: Leroghi, several observations in October 1999 and one on 15 May 1998, the latter one perhaps representing an over-summering individual; Marsabit, observed almost daily in late February and early March 2000; Mt Kulal, numerous observations in December 1997; Mt Nyiru, two observations in November 1998 and two in February 2004. Almost all of these observations were recorded in dense montane forest habitats or along forest edges, suggesting that the forests of northern Kenya may represent a regular wintering habitat for this species.

Eleonora's Falcon *Falco eleonorae.* This species is an uncommon winter visitor to central and southern Kenya. There is only one record from northern Kenya (Lewis & Pomeroy 1989).

We observed one individual, of the black morph, flying over a large glade in the forest at Marsabit National Park on 9 March 2000. The bird was positively identified by its blackish plumage, with flight feathers

slightly paler than the underwing coverts.

Eastern Bronze-naped Pigeon *Columba delegorguei.* The presence of this species in the montane forests of Northern Kenya (Mt Kulal, Mathews Range, Mt Nyiru) is already known (Lewis & Pomeroy 1989). Therefore, our observations do not provide much new distributional information, but contribute to the understanding of the migratory movements of the species. We found that Eastern Bronze-naped Pigeons were common during October–February in montane forest habitats on Leroghi (October 1999) and Mt Nyiru (December 2000, February 2004), where we totalled more than 50 observations in eight weeks of fieldwork. However, the species was totally absent in the same areas in March 1999 (Mt Nyiru) and April–May 1998 (Leroghi) with no observation in five weeks of fieldwork. This suggests that the species is a seasonal visitor to northern Kenya during the late dry season and the short rainy season and that it might be involved in longer-range movements than has usually been supposed.

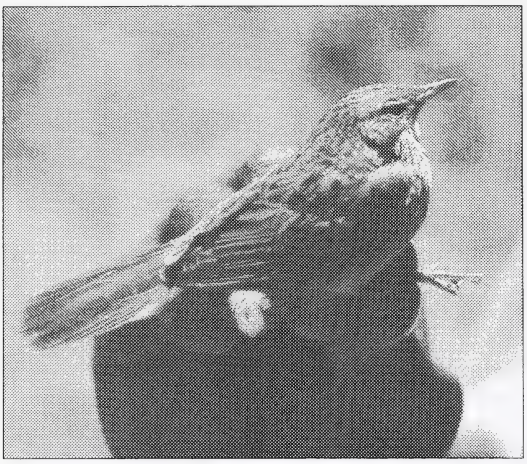
Masked Lark *Spizocorys personata.* According to Zimmerman *et al.* (1996) the birds from the southern end of Lake Turkana are not racially assigned. We observed one individual of subspecies *yavelloensis,* (being greyer than the nominate race) at Soitolowarak on 30 November 1998.

Cabanis's Greenbul *Phyllastrephus cabanisi.* Two subspecies of Cabanis's Greenbul are found in Kenya: *P. cabanisi sucosus,* and *P. cabanisi placidus,* which are located respectively west and east of the Rift Valley (Britton 1980). The two races intergrade in central Kenya, and, according to Zimmerman *et al.* (1996) the birds from Leroghi are not racially assigned.

During ringing operations in Leroghi in April–May 1998 and October 1999, we captured a total of 27 individuals of this species, which could all be reliably assigned to the race *placidus* by their creamy-white throat and more brownish plumage.

Grasshopper Warbler *Locustella naevia.* This species has been observed only once in Kenya, on 19 June 1977, when an individual of unknown race was captured and photographed in the Nguruman escarpment (Zimmerman *et al.* 1996). The only Ethiopian record is believed to be *L. n. straminea,* the West Asian subspecies (Ash 1978). Although the migratory movements of this species are quite poorly known, the western race (*L. n. naevia*) is believed to winter mostly in western Africa south of the Sahara (Cramp & Brooks 1992).

We ringed one individual of Grasshopper Warbler at Lake Paradise, Marsabit National Park, on 8 March 2000. The bird was mist-netted in a dense bush of *Ocimum suave,* about 70 m from the lake shore. It had an



Grasshopper Warbler *Locustella naevia* northern Kenya, L. Borghesio.

altogether fresh plumage and no apparent fat reserves. The brownish (not greyish) upperparts and relatively large body size (wing=64 mm; tail=53 mm; bill to rear of nostril=8.9 mm) suggest that the individual we captured was a member of the western group of races (*L. n. naevia* or *L. n. obscura*). If this is the case, this could be an indication that the wintering range of the western sub-species of the Grasshopper Warbler might be much wider than previously thought. This record is currently under review by the East Africa Rarities Committee.

African Reed Warbler *Acrocephalus baeticatus.* This species is widely distributed in sub-Saharan Africa, but records north of the equator are patchily distributed. The movements and taxonomic status of the different populations are not well understood, and different authors have treated this species very differently, either splitting it into two species (Clancey 1975) or merging it with either *A. dumetorum* (Fry *et al.* 1974) or *A. scirpaceus* (Dowsett-Lemaire & Dowsett 1987). In Kenya, the race *cinnamomeus* is distributed around the Lake Victoria area, and is occasionally attracted to lights at Ngulia, which suggests it undertakes migratory movements (Urban *et al.* 1997).

On 7 and 8 March 2000 we captured two individuals of this species at Lake Paradise, in an *Ocimum suave* bush. The habitat where they were caught and the presence of fat reserves (scored as 2 on a 0–8 scale) suggest that the two birds were passage migrants to the site. Measurements and wing formulae (wing length=56 mm; tail length=43–45 mm; wing tip on P4) of the two birds (which had fairly fresh feathers) were within the range of *A. b. cinnamomeus*, but plumage colour was much less rufous above (and almost white below) and not bright buff as in typical *cinnamomeus.*

These data suggest that northern Kenya is frequented by migratory populations (of unknown origin) of *A. baeticatus*, which differ in plumage colour from *A. baeticatus cinnamomeus*, and might even be subspecifically distinct.

Chiffchaff *Phylloscopus collybita.* Chiffchaff is considered an uncommon winter visitor (less than 50 records, EANHS 1996) to the montane forests

of Kenya. In Northern Kenya, there are old records of this species at Marsabit during the 1920s (Sharpe 1931), but no further data after that.

During our field-work, we mist-netted and ringed a total of 12 individuals: five at Mt Nyiru between 3 and 18 December 2000 and another two on 7 and 9 February 2004, and five at Marsabit National Park between 30 November and 2 December 2002. Numerous additional sight records were also obtained at Mt Kulal (December 1997), Mt Nyiru (December 2000 and first half of February 2004) and Marsabit (December 2002). All the observations and captures were made in deep forest habitats, while forest edges were usually frequented by Willow Warbler *Phylloscopus trochilus*. The measurements of the individuals caught (wing=63.1±2.1 mm, n=12; tarsus=19.3±0.5 mm, n=7) were in the range of those of *P. c. abietinus*, which is the only subspecies of Chiffchaff presently known to occur in East Africa (Zimmerman *et al.* 1996). Interestingly, Chiffchaffs were apparently completely absent from Marsabit forest in early March 2000. However, on this occasion, Willow Warblers were extremely common (37 individuals mist-netted from 3 to 11 March 2000), not only in edges, but even in dense forest areas, suggesting that the residence period of Chiffchaff in the forests of northern Kenya is quite short.

On the whole, our observations suggest that Chiffchaff might be rather more common and widespread in Kenya than previously thought. The few records obtained in the past are perhaps due to the scarcity of research that has been directed towards montane forest areas in East Africa.

Sharpe's Starling *Cinnyricinclus sharpei.* This forest canopy species is distributed from Eastern Zaire to the highlands of central Kenya and northern Tanzania and to southern Ethiopia. In northern Kenya it is considered very rare and is presently known only from Marsabit and the Mathews Range (Zimmerman *et al.* 1996).

We observed this species on several occasions at Mt Kulal (December 1997), Leroghi (April–May 1998 and October 1999), Mt Nyiru (November 1998) and the Ndoto Hills (March 1999). These observations suggest that the species is widespread in the forests of northern Kenya, where it might have been overlooked because of its arboreal habits.

Abyssinian Black Wheatear *Oenanthe lugubris.* This species is fairly common in the highlands of central Kenya, where the race *schalowi* occurs. The nominate race is known only from the Ethiopian plateau, but there is one unsubstantiated record from Mt Kulal, August 1985 (Zimmerman *et al.* 1996).

We recorded several individuals of *O. l. lugubris* in open grassland at Arabel, at 2000–2100 m, on the northern end of Mt Kulal, on 23 and 29 October 1998. The birds were assigned to this race on the basis that they

had the basal two-thirds of the outer tail feathers dirty white in the male, and almost white in the female (not orange-buff, as in *O. l. schalowi*).

Yellow-crowned Canary *Serinus flavicollis.* Although the Yellow-crowned Canary is widely distributed in the highlands of central Kenya, there are presently no records of this species from northern Kenya. Therefore, up to now, evidence suggests that the Ethiopian population is separated from the Kenyan one by a gap of several hundreds of kilometres, even though they are both ascribed to the same subspecies (*S. f. flavivertex*, Howard & Moore 1991).

During our surveys, this species was observed on various occasions at Mt Kulal (October 1998), Mt Nyiru (February 2004) and Leroghi (October 1999). It always occurred in forest edge habitats, dominated by *Juniperus procera* and *Olea africana*, at altitudes between 2100 and 2500 m.

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Comments on the distribution of Cape Teal *Anas capensis*

Robert J. Dowsett

Baker (2003) has summarised the distribution and status of the Cape Teal *Anas capensis*, principally its northern populations. This note presents some supplementary data and comments.

Southern-African population

The northern-most records attributed to this population are from Zambia. Baker's map shows the most north-easterly plot in the Kasanka/Bangweulu area, but there is no record from there, and this is apparently a slip for Luanshya (13°08'S, 28°25'E), on the Copperbelt (Taylor 1982). The species is known from ten 30-minute squares in Zambia (Dowsett *et al.* in prep.), rather than nine, essentially as a vagrant; the two breeding records were from the extreme west in 1964 (Benson & Pitman 1966), a very cold winter during which several species irrupted into Zambia from southern Africa. There is no evidence for Baker's suggestion of an increase of sightings in Zambia: on the contrary, there has been no certain record since 1981.

There is also an acceptable Malawi record, not mentioned by Baker, from Bunda dam, Lilongwe District (14°11'S, 33°48'E) (Douglas & Lomosse 1981).

Rift Valley-centred population

Baker (2003) does not mention Zaire, although his map suggests Cape Teal might occur in the north-east. It is on the Zaire list (Dowsett 1993b, Pedersen 2004) on the basis of a bird shot with a .375 rifle by Mouritz (1914) in November or December 1911 (it was not saved; there can't have been much left). This was on a stream in the Katanga, in the Moushosi (Musoshi) area (*c.* 11°55'S, 27°47'E). This is an unlikely place and date for this species, and his account gives no details of how it was identified (it is almost the only duck he mentions). It is probable that Mouritz misidentified this bird: there were, for many years, claimed specimens from the Copperbelt and north-eastern Zambia which, on examination, turned out to be Garganey *Anas querquedula* (Benson *et al.* 1970).

On the other hand, Chapin (1932) mentions his own sight record from brackish water at Katwe, Lake Edward (*c.* 08°00'S, 29°53'E), noting the key identification feature. This would presumably be from Uganda rather than Zaire and, if acceptable, would be the first and only record from that country.

Chad basin-centred population

Central African Republic and Cameroon

Both these countries were included in the range by Mackworth-Praed & Grant (1970), followed by Scott & Rose (1996) among others. This duck has never been reported from C.A.R. (e.g. Dowsett 1993a, Dowsett *et al.* 1999). There is one report from northern Cameroon (Ngaoundere, i.e. lac Dang at 07°26'N, 13°33'E), eight on 17 October 1992 reported by S. Keen in the Bulletin of the African Bird Club (vol 1, p28) though not yet formally documented in print.

Djibouti

Though not mentioned by Baker (2003), but Cape Teal has been recorded by Laurent (1990) in this country.

Niger

The Nguigmi record of 80 birds in December 1964 (Hopson 1965) is from the Niger side of Lake Chad (14°15'N, 13°07'E), not Nigeria as listed by Baker. This record was overlooked by Giraudoux *et al.* (1988), who gave the one other record for that country as Cheri oasis (13°26'N, 11°21'E), two on 24 August 1975.

Chad

The only really large numbers are the 300 reported from Chad by Vieillard (1972). Otherwise, there are records from Baga Sola, Lake Chad (13°32'N, 14°19'E) a few on 15 December 1969 (Fry 1970); Arada (15°01'N, 20°39'E) four on 2 August 1977 (Newby 1979); lac Yoan d'Ounianga Kébir (19°10'N, 21°35'E) 50–60 from 1 to 12 December 1963 (collected); *ibid.* 24 April 1954 (Salvan 1967).

It was only *thought* to have been seen on the Logone river in October 1945 by Anna (in Salvan 1967), a record best treated as unproven. The records from Kufra oasis were, indeed, from Libya and reported as extralimital by Salvan (1967). Later observations there included two pairs displaying in early April 1968 (Cramp & Conder 1970).

Nigeria

It is useful to clarify the records from northern Nigeria. Those that I know of are:

Bulatura potash oasis (13°20'N, 11°10'E) up to 50, September, December and February 1973–6 (Hall 1976a). This is the same location as the soda lake north of Yusufari mentioned by Baker (2003).

Minetti and Dowoshiram (south-east shore of Lake Chad) including two at Minetti (*c.* 12°50'N, 13°30'E) November (Hall 1976b, Hall 1977).

Malamfatori (13°37'N, 13°20'E) listed by Hopson (1965), and one seen on 24 September 1968 (pers. obs., see below); more recently up to 20 on 24 August and 11 September 2000 (Gustafsson *et al.* 2003).

Kazaure (12°39'N, 08°23'E) six on 6 April 1979 (Sharland & Wilkinson 1981).

Zaria (11°03'N, 07°42'E) a single vagrant on 17–18 November 1975 (Dyer 1977).

Thus there is no published Nigerian record for the period between 7 April and 23 August, which covers the rains, the known breeding period in western Sudan (Lynes 1925). The statement by Elgood *et al.* (1994) that the species is resident in Nigeria is unproven. Note that the two extreme vagrant records from saltpans in coastal Ghana are December and March (Grimes 1987).

I saw this duck at Lake Chad only once in 1968, despite sailing to most shores of the lake, which was large in those days. There were a number of brackish areas, and locally some salt extraction, as described by Alexander (1907). Although Alexander noted only 'occasional duck that were very wild' on his first of two voyages on the lake, to the east side, in early December, he did collect the species (Bannerman 1930, Hutson & Bannerman 1930). Despite Vieillard's records, I doubt the population there has ever been in the hundreds, except very transiently. The suggested total of 500 for the Lake Chad basin (Baker 2003) appears generous, and the absence of any movements from other areas remains to be proven.

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Scopus 24: 41–45, July 2004 Received **23 March 2004**

Short communications

Black-rumped Buttonquail *Turnix hottentota* in Serengeti National Park, Tanzania

On 16 January 2003 we were exploring some loop roads in the Simba Kopjes area of Serengeti National Park. There had clearly been good rain as the entire area was very green with much fresh grass growth measuring between 30–40 cm and even longer in places. On reaching a very shallow drainage line across the plains, the tracks became muddy and scattered with puddles. As it became increasingly wet the grasses were replaced by tall, luxuriant sedges.

It was on the edge of this wet area that we first flushed a buttonquail. It came from near the edge of the track in a stretch where the ground was very moist, but with little standing water. The surroundings were open with lush, green grass about 30 cm tall. The bird was immediately identified as Black-rumped, a species we know very well from Zambia. In our experience, the prominence of the dark rump is usually exaggerated in field guide illustrations, but on this individual it was surprisingly conspicuous. We also noted the rather simple and dark coloration of the upperparts with uniform rufous-brown mantle, scapulars and upperwing coverts and dark brown remiges as opposed the rather variegated and generally paler pattern typical of Common Buttonquail *Turnix sylvatica* (Leonard 1997). This wing pattern is easiest to see as the bird banks and briefly glides prior to landing and at this point we also noted the orange wash on the side of the face and neck.

Fortunately, the bird had not flown far and we were able to flush it a second time to confirm our observations. At this point we were not aware that the record was unusual as it seemed to be a perfect location for the species. In Zambia birds are typically in very open grassland with no trees or shrubs. Birds are characteristic of wetter areas or at least areas that are liable to regular water-logging (Beel 1997, Benson *et al.* 1971). An analysis of Zambian records suggests that birds are migratory (Leonard 1999), a theory supported by the species' tendency to fly into lights at night (Benson *et al.* 1971). It therefore seems probable that the bird in the Serengeti would have arrived after heavy rain produced suitable conditions. Judging by the large areas of suitable habitat, it also seems possible that the species may prove to be more regular in the area once explored more thoroughly.

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Black-rumped Buttonquail is known from Uganda and Kenya but there appears to be only one previous record in Tanzania, mentioned in Britton (1980), from Ugano in Songea. (N. Baker *in litt.* to editor).

Britton, P. L (ed) 1980. *Birds of East Africa.* Nairobi: East Africa Natural History Society.

Breeding of Roseate Tern *Sterna dougallii* in Mafia Island Marine Park, Tanzania

The Mafia Island Marine Park is best known for its underwater biodiversity (MIMP 2000) but it also has ornithological value. The Kinasi pass is the eastward outflow into the Indian Ocean of the channel of Chole Bay and is characterised by a series of small vegetated fossil coral islands and some smaller mushroom-shaped limestone crags without any vegetation, located at approximately 39°48′40″E, 07°56′40″S. On 2 August 2003 groups of relatively small terns were observed from a boat, feeding in and beyond the surf zone at the reef edge in this area. They were identified as Roseate Terns *Sterna dougallii* on the basis of their bright, white plumage, long tail streamers, complete black caps, bright red legs and a variable amount of deep red on the bill, with some bills entirely deep red, others having blackish tips. Good views were obtained of birds flying towards two of the islands and one of the limestone crags in the area, with some carrying small fish. At all three sites there was a continuous presence of calling and hovering terns. We suspect that this behaviour is indicative of breeding and that as many as 150 pairs may have been breeding in the area.

The two islands used by the terns have an outer, unvegetated, coral-rag zone, possibly caused by salty spray, and it was over this that most of the activity was observed. Though small fish were clearly being carried into these areas, it was impossible to confirm if there were actually young present. The surface of the limestone rocks was high relative to sea-level and was heavily eroded with deep depressions so that young birds could easily have been hidden from sight.

Roseate Tern used to be classified as globally near-threatened (IUCN 2000) but this category is no longer recognised by BirdLife International and, therefore, the species does not figure in more recent versions of the

Red List of Threatened Species. The bird is known to breed in similar habitat on the North Kenyan coast (Stevenson & Fanshawe 2002). Moreau (1944) reports an observation made by Pigott and Darling who found a number of single tern eggs from a very similar piece of coral rag only 7 m across, on the southernmost islet of the Mafia group (Jibondo), on 26 August 1942. At that time local informers stated that the main breeding season was a month later, which led Moreau to assume that breeding in Mafia was appreciably later than in similar habitat on Pemba and Unguja. The present observation of nesting in early August, however, would put the seasons in both areas at similar dates. On the basis of Moreau (1944), Baker and Baker (2002) suggested that Roseate Terns might still be breeding in coral rag habitat around Mafia Island and this has thus been confirmed by the observation reported here, which is the first breeding record from the archipelago for over 50 years.

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Scopus 24: 47–48, July 2004 Received **5 September 2003**

A range extension for Zenker's Honeyguide *Melignomon zenkeri* from Kibale National Park, Uganda

In the late afternoon of 10 August 2002 I was observing birds *c.*500 m north of the Makarere University Biological Field Station at Kanyawara, Kibale National Park, western Uganda. A large mixed-species flock was moving across the main track, near the forest edge, so I used a combination of 'spishing' and Red-chested Owlet *Glaucidium tephronotum* playback to draw the birds in. Birds in evidence included Red-headed Malimbe *Malimbus rubricollis*, Purple-headed Starling *Lamprotornis purpureiceps*, Collared Sunbird *Hedydipna collaris*, Buff-

throated Apalis *Apalis rufogularis,* Yellow-whiskered Greenbul *Andropadus latirostris* and many others.

Many birds approached, showing aggravation and, since the canopy and midstorey of the forest were fairly open, I could observe many of them clearly. The white outer tail feathers of a bird caught my attention as it dropped down from the lower canopy (*c.*15–20 m high) and perched less than 5 m away, *c.*5–6 m up. It held its body horizontally, and moved its body from side to side, presumably an indication of its agitation. Given the bird's size (similar to that of a Lesser Honeyguide *Indicator minor),* I expected it was a Thick-billed Honeyguide *Indicator conirostris,* a species I had heard calling daily over the previous week. The bird was rather stocky, with a medium-length tail, of medium breadth along its entire length, shortish, broad neck and small head. The general colouration was a dull olive with a slightly greyer head, orangey-yellow legs and a medium-length, black, rather fine bill, dissimilar in shape to that of any Indicator species. Superficially the bird most closely resembled a Little Greenbul *Andropadus virens* in appearance. When the bird flew back up towards the lower canopy the white outer tail feathers were once again conspicuous. I continued to 'spish', managing to attract the bird once more to verify my observations. This time I also noted a yellowish tinge to the undertail coverts.

The combination of these features fits only Zenker's Honeyguide (Borrow & Demey 2001; Fry *et al.* 1988). Zenker's Honeyguide is a scarce lowland forest species, which occurs from southern Cameroon to western Uganda, through much of the Congo Basin. It is reported to prefer secondary situations and forest edge (Borrow & Demey 2002) up to 1530 m (Fry *et al.* 1988). The only previous east African records come from the Bwamba Lowlands/Semliki Valley, on the western border of Uganda (Fry *et al.* 1988). This constitutes a new record for Kibale National Park and an eastward extension of the previously known range of this secretive forest honeyguide. Coming from an altitude of *c.*1500 m, this record also comes from near the upper altitudinal range reported for this species.

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Received **25 October 2002**

First record of Orange-cheeked Waxbill *Estrilda melpoda* in East Africa

Four adult Orange-cheeked Waxbills were found on 1 June by KD and again (with GB) on 7 June 2003. They were in bushes in open palm swamp where the Nkisi River dissipates into swamp and forest, a few hundred metres from the Ntandi HQ of Semliki National Park in western Uganda (00°48′N, 30°08′E). They were small finches with a red bill, grey head and underparts with a distinct orange patch from cheek to bill base, enclosing the eye, and a pale yellowish centre of belly extending to the vent. The upperparts and wings were dull brown, the rump red and the tail black. They frequently uttered short, high-pitched calls and were foraging low in dense bushes, sometimes flying up to higher, prominent perches. The group of four appeared to be composed of two pairs of adults and, at times, mixed with a small flock of Bronze Mannikins *Lonchura cucullata*. One waxbill was seen catching a newly emerged dragonfly *Orthetrum julia*, a rather large prey item. Although Orange-cheeked Waxbills are known from the vicinity of Bujumbura in Burundi (Stevenson & Fanshawe 2002), this constitutes a new record for the East African list as defined by Britton (1980).

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 Received **4 July 2003**

Book review

Fry, C.H., & Keith, S. (eds) 2004. *The birds of Africa. Vol VII. Sparrows to buntings.* London: Christopher Helm. Pp. xxii + 666, 36 colour plates by Martin Woodcock. ISBN: 0 7136 6531 9. UK price £135.

The Birds of Africa project had its origins in the mid-1960s when Leslie Brown thought of writing an authoritative handbook on Africa's avifauna. The seventh, and last, of these volumes has now been published. It comprehensively deals with 309 species from largely seed-eating bird families (sparrows, weavers, malimbes, bishops, widowbirds, waxbills, firefinches, pytilias, mannikins, whydahs, indigobirds, finches, canaries and buntings) and recaps the 25 year project.

A contents summary box for each of the seven bulky volumes gives a quick guide to the 2134 bird species covered. The degree to which species ranges are determined by vegetation and topography can readily be appreciated by comparing coloured maps of the same size as the species distribution maps provided in this volume. Colour plates, although slightly 'over-warm', are drawn to scale to provide an immediate idea of size. Line drawings are used throughout to illustrate, for instance, features during breeding such as nests, nestling down in waxbills and nestling gape spots of whydahs. The referred literature is up-to-date and brings together even simple observations published in bulletins and newsletters.

This, and the other volumes in the series, will not only benefit ornithologists, researchers, conservationists and biology students, but are good reference material for bird guides, tourists and serious birdwatchers. It obviously fulfils the objectives of the Birds of Africa project: to integrate salient facts from field, literature and museum to produce a compendium characterising the lives and biology of every African bird species. This is despite a sad ending: Stuart Keith, one of the editors of this volume and an advisor and author in the project, died just when this volume had gone to press.

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A copy of this volume is now deposited at the library in the Ornithology Department, National Museums of Kenya, courtesy of the publisher. Ed.

News

OWL—a new bibliographic database for ornithologists

The BOU, AOU, and Birds Australia are proud to announce the replacement of Recent Ornithological Literature (ROL) with the new Worldwide Ornithological Literature (OWL).

OWL is an indexed bibliographic database of citations from the worldwide scientific literature that pertain to the science of ornithology. OWL deals almost exclusively with serial publications. The new database is accessible at www.BIRDLIT.ORG at no charge.

OWL's scope will be more than just the "recent" literature of ornithology. Eventually, the goal is to have the online database go back 50 or more years for citations to the serial literature.

OWL also asks for citations for all recent doctoral dissertations and those papers published in obscure serials not usually covered in OWL. Anyone interested in helping should contact Jay Sheppard, Managing Editor (JMSheppar@aol.com) or Bob Dowsett, Afrotropical Coordinator (Dowsett@aol.com), for a list of journals needing abstractors and other information. Abstractors should ideally have access to a computer and their assigned journals.

Over 1100 serials have been cited in ROL/OWL since 1990. In a sample, 24% were exclusively ornithological in scope, 73% were not, and 3% were undetermined. Bibliographies from forty Birds of North America life history accounts were evaluated. Of the 5442 total citations, 66% were serials. A comparison revealed that 59% of the serial citations should have been found in Biological Abstracts and approximately 96% should have been found in the ROL. These numbers are only for comparative purposes, as many papers preceded both indexes by decades, if not a century or more. The commercial abstracting services charge a considerable fee for their services, while OWL is free to any Internet user. The database will be expanded with the addition of the old ROL supplements to the Ibis, Auk, and Emu printed over the past 20 years. By the end of 2004, we expect to have a searchable database of 75–100 000 records.

In the 21st Century, any previously published scientific information that cannot be later found is literature that may be lost to science. We must be able to find all those papers published in our field of interest regardless of where in the world one is working. Please consider helping abstract. This is not an exceptionally time-consuming endeavour. You will be helping generations of ornithologists to come.

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East Africa Rarities Committee

As reported in the last issue of Scopus, the East Africa rarities committee has recently been reconstituted and has just completed the first circulation of records. This has resulted in the acceptance of several new species to national lists and the regional avifauna, as detailed below. Further details of some of these sightings can be found as short communications in preceding pages. If you have any records which warrant consideration, please send full details to the *Scopus* editor: jeremy.lindsell@rspb.org.uk who is currently acting as secretary for the committee. The committee will currently consider up to the first five records for Kenya, Uganda and Tanzania. Records from other countries in the *Scopus* region (Sudan, Ethiopia, Djibouti, Somalia, Rwanda, Burundi, Zambia, Malawi and Indian ocean islands) can also be submitted to the editor. The current committee members are: David Fisher, David Pearson, Don Turner, Colin Jackson, Willis Okech, Neil Baker and Jeremy Lindsell.

Common Crane *Grus grus*
First for East Africa. Single bird NE of Eldoret, Kenya, 2 October 1999. Carol Kruger.
Mallard *Anas platyrhynchos*
Second record for Kenya. Nine birds, Lake Paradise, Marsabit National Park, northern Kenya, 30 November to 3 December 2002. Luca Borghesio.
Great Bittern *Botaurus stellaris*
First for Uganda. Single bird, Kibimba Rice Scheme, eastern Uganda, 20 November 2002. Malcolm Wilson *et al.*
Saker *Falco cherrug*
First for Uganda. Pair, Mount Moroto, north-eastern Uganda, 8 January 2001. Malcolm Wilson.
Red-footed Falcon *Falco vespertinus*
First for Uganda. Single bird, Murchison Falls National Park, Uganda, 4 October 2000. Malcolm Wilson.
Long-tailed Skua *Stercorarius longicaudus*
First for Tanzania. Three birds, Pemba Channel, 22 February 1997. Jim Vaughan.
Zenker's Honeyguide *Melignomen zenkeri*
Third documented record in Uganda. Single bird, Kibale National Park, Uganda, 10 August 2002. Michael Mills.
Pied Flycatcher *Ficedula hypoleuca*
Second record for Kenya. One bird (possibly two), Kakamega Forest, Kenya, 26 February 2002. Bernd de Bruijn and Jan Joost Bakhuizen.
Black-collared Eremomela *Eremomela atricollis*
First for East Africa. Several individuals, Sumbawanga district, Rukwa region, Tanzania, 1 February 2002. Stuart Norman.

House Sparrow *Passer domesticus*
First for Uganda. Ten birds, Kibimba Rice Scheme, eastern Uganda, 21 November 2001. Malcolm Wilson.
Chestnut-mantled Sparrow-Weaver *Plocepasser rufoscapulatus*
First for East Africa. Mpanda-Inyonga road, Mpanda district, Rukwa region, Tanzania, 15 July 2001. Stuart Norman.
Orange-cheeked Waxbill *Estrilda melpoda*
First for East Africa. Four adults together, near Ntandi, Semliki, Uganda, 1 and 7 June 2003. K.D. Dijkstra and Godfrey Balyesiima.

New reports

The following unconfirmed reports have been received, some of which are currently under consideration by the rarities committee.

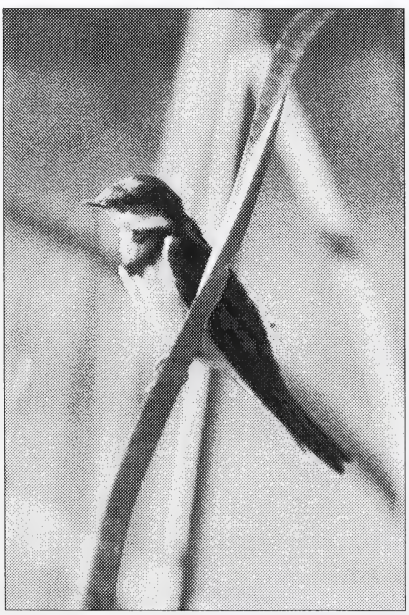
Kenya

Beaudouin's Snake-Eagle *Circaetus beaudouinii*, Mungatsi, western Kenya, 21 January 2001; Short-toed Snake-Eagle *Circaetus gallicus*, Tsavo East National Park, 2 February 2001; Common Redshank *Tringa totanus*, near Nakuru, 21 January 2004.

Tanzania

Cape Shoveler *Anas smithii*, between Moshi and Arusha, 9 October 1997; Masked Shrike

Cape Shoveler *Anas smithii*, Tanzania, N. Baker.



Redshank *Tringa totanus* (above) with Marsh Sandpiper *Tringa stagnatilis*, Kenya, D. Fisher. White-throated Swallow *Hirundo albigularis* (left), Tanzania, N. Baker.

Lanius nubius, Pemba Island, 20 November 2003; Red-footed Booby *Sula sula* and Brown Booby *Sula leucogaster*, Latham Island, 19–20 November 1993.

Uganda

White-crowned Plover *Vanellus albiceps*, Murchison Falls National Park, 10 July 2003 and 29 January 2004.

Wasser, S.K. (eds) *Biogeography and ecology of the rainforests of Eastern Africa.* Cambridge: Cambridge University Press.
Urban, E.K., Fry, C.H. & Keith, S. (eds) 1986. *The birds of Africa. Vol. 2.* London: Academic Press.

Contributions should be submitted by email or on paper (two copies) with a copy on disc as a Rich Text Format (RTF) file. Manuscripts should be typed in double-spacing on one side of the paper only, with wide margins all round. Original black-and-white photographs and line illustrations should not be larger than A4 (210 x 297 mm). Line illustrations should be on good quality white paper or board, or on tracing material, with lettering of professional quality (if this is not possible, label an overlay, not the original figure). Copies of graphics as separate electronic files in TIFF, EPS or JPEG format are appreciated.
Authors of papers receive five copies, and authors of short communications one copy, of their contribution *gratis.* Extra copies, charged at cost, must be ordered when the MS is accepted.

Please send all contributions to:
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Rare birds in East Africa
Records of rare birds in Kenya, Tanzania and Uganda are assessed by the East Africa Rarities Committee. A full account of the record should be sent to the *Scopus* editor at the address above or East Africa Rarities Committee, c/o Nature Kenya, P.O. Box 44486, GPO 00100, Nairobi, Kenya.
Tel. +254 20 3749957.
email: jeremy.lindsell@rspb.org.uk
Records from other countries in the region can also be submitted for review and possible publication in *Scopus*.

Ringing scheme of eastern Africa
This covers several countries in the area. Qualified and aspiring ringers should contact the ringing organizer, Graeme Backhurst, P.O. Box 15194, Langata 00509, Nairobi, Kenya.
Tel. +254 20 3891419.
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EANHS Nest Record Scheme
Details of most kinds of breeding activity are welcomed by the scheme and nest record cards may be obtained free of charge from the Nest Record Scheme organizer, c/o Nature Kenya, P.O. Box 44486, GPO 00100, Nairobi, Kenya.
Tel. +254 20 3749957.
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The BirdLife International Partnership in eastern Africa
The BirdLife Partnership in eastern Africa co-ordinates bird conservation work and produces several other publications of interest to ornithologists.

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Scopus 24, July 2004

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